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ABSTRACT

Experts now estimate that one half to three quarters of a million infants are born each year who have been exposed in utero to one or more illicit drugs. When legal drugs--alcohol and tobacco--are added, the figure rises to considerably more than one million substance-exposed infants. This monograph is one in a series created by the Educational Development Center to address the needs of administrators and teachers for accurate, up-to-date information on the effects of prenatal exposure to alcohol and other drugs. The report also examines what is known about other risk factors that may amplify these effects or produce similar consequences. The first chapter of the report addresses what the research suggests about the short- and long-term effects of prenatal exposure to alcohol and other drugs. The second chapter discusses environmental factors which, by themselves or in combination with the effects of prenatal exposure to alcohol or other drugs, can affects a child's development. The third chapter explores the implications of prenatal exposure for preschool and primary education and describes specialized programs that serve children identified as having been prenatally exposed to alcohol or other drugs, as well as the behavioral and developmental characteristics these children display. Finally, the report sums up the central findings and suggests ways that this information can guide the development of strategies, techniques, and materials to help teachers and administrators provide children at risk with appropriate and effective educational experiences. Two appendices list sources of information used in the monograph and experts interviewed. Contains 428 references. (HTH)

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Risk and Reality

Implications of Prenatal Exposure to Alcohol and Other Drugs

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Risk and Reality

Implications of Prenatal Exposure to Alcohol and Other Drugs

By Joanne P. Brady, Marc Posner, Cynthia Lang, and Michael J. Rosati

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Risk and Reality: Teaching Preschool Children Affected by Substance Abuse (a video and teachers' guide for preschool staff)

Helping Children Affected by Substance Abuse: A Manual for the Head Start Management Team

Teaching Head Start Children Affected by Substance Abuse: A Training Guide for Education Teams

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Introduction

The use of illicit drugs and abuse of alcohol exact a steep price from our society. The complicity of substance abuse in serious social ills such as crime, domestic violence, and traffic injuries is well established. Recently, however, another threat has come to the attention of the public. This is the threat to children born to women who abuse alcohol and other drugs during their pregnancy. Experts now estimate that one-half to three-quarters of a million infants are born each year who have been exposed to one or more illicit drugs in utero. When the legal drugs—alcohol and tobacco—are added, the figure rises to considerably more than one million substance exposed infants.

The onset of the crack epidemic during the 1980s gave rise to a number of rather dramatic articles in the press that often presented an image of drug-exposed infants and children as "hopeless" members of a "lost generation" (Toufexis 1991; Norris 1991). These articles, based largely on anecdotal accounts, helped to fuel a number of misperceptions:

- There are an ever-increasing number of drug-exposed children who will in time overrun Head Start programs, early elementary classrooms, and social service agencies.
- There are permanent neurological, developmental, and behavioral consequences that are directly attributable to prenatal drug exposure.
- Preschools and schools are unprepared to effectively control and educate children who were prenatally exposed to drugs.

As a result of these portraits of children with intractable deficits, Head Start and public school staff have grown concerned about the unknown numbers of drug-exposed children who might enter their classrooms. In fact, teachers and administrators report increasing numbers of children who lack social skills and have difficulty keeping pace with routine demands. Some children are persistently withdrawn; others are prone to sudden episodes of violence. Primed by inaccurate media reports, educators have begun attributing these behaviors, as well as a wide range of other behaviors and developmental delays, to the effects of prenatal drug exposure.

Although prenatal drug exposure has captured a great deal of public attention, prenatal exposure to alcohol is more widespread and has perhaps

an even more serious impact. The National Institute on Drug Abuse estimates that 60 percent of women of childbearing age consume alcoholic beverages despite the fact that alcohol consumption during pregnancy is implicated in a wide range of birth defects and developmental disabilities, including mental retardation, physical abnormalities, and visual and auditory impairments.

As they assess the threat that prenatal exposure to alcohol and other drugs presents to children and schools, policy makers and practitioners must separate myth from fact. The practice of labeling children should also be avoided since it can lead teachers and parents to have diminished expectations for educational success. Finally, educators and parents need assistance in creating an educational environment that will enable children to fulfill their potential.

Overview of the Monograph

This monograph is one in a series of products created by Education Development Center, Inc. (EDC) to address the needs of administrators and teachers for accurate, up-to-date information on the effects of prenatal exposure to alcohol and other drugs. This report also examines what is known about other risk factors that may amplify these effects or produce similar consequences.

The first chapter addresses what the research suggests about the short- and long-term effects of prenatal exposure to alcohol and other drugs.

The second chapter discusses environmental factors which, by themselves or in combination with the effects of prenatal exposure to alcohol or other drugs, can affect a child's development.

The third chapter explores the implications for education in preschool and primary grades and describes specialized programs that serve children identified as having been prenatally exposed to alcohol or other drugs, as well as the behavioral and developmental characteristics these children display.

Finally, this report sums up the central findings and suggests ways that this information can guide the development of strategies, techniques, and materials to help teachers and administrators provide children at risk with appropriate and effective educational experiences.

As they assess the threat that prenatal exposure to alcohol and other drugs presents to children and schools, policy makers and practitioners must separate myth from fact.

CHAPTER 1

Effects of Prenatal Exposure to Alcohol or Other Drugs

Research on the extent and effects of prenatal exposure to alcohol and other drugs is complex and sometimes contradictory. This chapter contains five major sections. It begins with a discussion of some important methodological issues. A second section examines data on the prevalence of prenatal exposure to alcohol and other drugs. A third section summarizes the current research on the effects of prenatal exposure to five widely used substances: cocaine, opiates, amphetamines and methamphetamines, phencyclidine hydrochloride (PCP), and marijuana, as well as research on "mixed" samples. Finally, the relationship between maternal use of alcohol and other drugs and the risk and developmental consequences of preterm and small-for-gestational-age (SGA) birth is examined. This chapter ends with some general conclusions on the effects of prenatal exposure to alcohol or other drugs.

Methodological Issues

The difficulties of research on the extent and effects of prenatal exposure to alcohol and other drugs are those common to any medical research conducted under nonexperimental conditions, those particular to an investigation of illegal or disapproved-of activities, and those particular to an emotionally charged subject.

Some of the methodological challenges include finding an appropriate sample.

- Most hospitals lack protocols for identifying pregnant women who use alcohol and/or other drugs; in addition, such protocols have limited use because people often do not admit such behavior (McCalla et al. 1992; McNagny and Parker 1992; Cohen, Green, & Crombleholme 1991; Lurio, Younge, & Selwyn 1991; Wilkins-Haug & Gabow 1991; GAO 1990;

Matera et al. 1990; Senate Office of Research 1990; Zuckerman et al. 1989; Zuckerman et al. 1985; Rouse, Kozel, & Richards 1985; Legislative Analyst n.d.).

- Toxicologic assessments can result in false positives or fail to reveal alcohol or other drug use because those substances have metabolized (Mayes et al. 1992; Szeto 1991; Larsen & Horowitz 1991; Matera et al. 1990; Hawks & Chiang 1986).
- Researchers frequently fail to base their prevalence estimates on samples representative of the general population (Mayes et al. 1992).
- Researchers often have trouble establishing a matched control group, especially when studying those groups most at risk of substance abuse (Chasnoff 1991; Strauss & Allred 1986).

Other problems concern the difficulty of isolating the effects of a particular substance and determining the relationship between the effects and both the amount of a substance used and when it was used during pregnancy.

- Researchers find it extremely difficult to control for the effects of other factors (such as prenatal care or nutrition) that influence perinatal and developmental outcomes (Mayes et al. 1992; Frank et al. 1988; Zuckerman & Hingson 1986; Neugut 1981).
- Polydrug use (including alcohol and tobacco) is common among women who use drugs (Chasnoff 1991; Streissguth et al. 1991a). Cigarette smoking has been linked to many of the perinatal and developmental effects also attributed to illicit drugs and alcohol (Zuckerman 1991b; Fried & Watkinson 1990; Haglund & Cnattingius 1990; Zuckerman 1988; Abel 1984; Pirani 1978).
- Toxicologic assessments reveal nothing about the overall pattern of the use of alcohol and other drugs (Day, Wagener, & Taylor 1985), and self-reports about this behavior lack reliability (Wilkins-Haug & Gabow 1991; Matera et al. 1990; Zuckerman et al. 1985; Rouse, Kozel, & Richards 1985; Legislative Analyst n.d.). It is possible that mixtures of illegal drugs, or combinations of illegal drugs and alcohol, have different effects than the use of a single substance (Randall 1992a).
- Illicit drugs vary greatly in dosage and purity (Chasnoff 1991).

Finally, individual studies and the pool of accessible research may reflect a bias. Koren et al. (1989), for example, found that reports concluding that there are minimal reproductive hazards associated with maternal use of cocaine were less likely to be accepted for presentation than reports finding greater hazards, regardless of methodological rigor. These methodological issues should be kept in mind

when considering estimates of the extent of prenatal alcohol and other drug exposure and interpreting research results.

Prevalence

Estimates of the Extent of Prenatal Exposure to Alcohol and Other Drugs

Prevalence estimates vary. Chasnoff and Griffith (1989) estimate that 11 percent of all newborns, more than 459,690 children born each year, have been exposed to illicit drugs. Gomby and Shiono (1991) estimate that more than 739,000 women each year use one or more illegal substances during a pregnancy.

The dramatic increase in the popularity of cocaine (and especially crack) during the late 1980s prompted much of the contemporary concern with prenatal drug exposure. Estimates of the percentage of children born prenatally exposed to cocaine (including crack) each year range from 1 to 4.5 percent (Gomby & Shiono 1991; Besharov 1990; GAO 1990). Using these rates, it is estimated that women give birth to between 41,790 and 188,055 children each year who were exposed to cocaine. (Unless otherwise noted, National Center for Health Statistics estimates of live births for 1990 provide the basis for all statistical extrapolations.)

Despite the growing use of cocaine, marijuana remains the most widely used illicit drug. Rates of newborns prenatally exposed to marijuana have been estimated at levels from 3 to almost 20 percent (MacGregor et al. 1990; Gomby & Shiono 1991; Hingson et al. 1982), which would indicate that every year women give birth to between 125,370 and 835,800 children prenatally exposed to marijuana.

Prenatal exposure to alcohol far exceeds that of illicit drugs. Gomby and Shiono (1991) estimate that women give birth to more than 2.6 million infants exposed to alcohol each year. Fetal Alcohol Syndrome (FAS) annually affects between 1.3 and 2.2 children per 1,000 live births in North America (US DHHS 1990; Streissguth & Giunta 1988). Researchers estimate that cases of Alcohol-Related Birth Defects (ARBD) exceed those of FAS by a ratio of 2:1 to 3:1 (Streissguth & Giunta 1988; Abel & Dintcheff 1984). This would indicate that women in the U.S. annually give birth to between 16,548 and 22,064 children exhibiting the effects of prenatal exposure to alcohol.

Other evidence also indicates that the number of children born exposed to alcohol and other drugs is high.

- 4.5 million (7.7 percent) of the women of childbearing age in the U.S. have used an illicit drug in the past month, including 601,000 cocaine users and 3.3 million who have used marijuana. Many more are heavy drinkers (NIDA, 1991).

- Childbearing-age women comprise the majority of women who use drugs (Yamaguchi & Kandel 1987).
- Women who use illicit drugs other than marijuana have a premarital pregnancy rate twice that of those who do not (Yamaguchi & Kandel 1987).
- The majority of women entering drug treatment programs have children (Deren 1986).

Research on a woman's consumption of alcohol and other drugs, once she knows she is pregnant, is inconclusive. Factors such as substance, age, socioeconomic status, and the presence of prenatal care may all affect consumption (Sarvela & Ford 1992; Poole 1992; Marques & McKnight 1991; Zambrana et al. 1991; Ihlen et al. 1990; Gilchrist, Gillmore, & Lohr 1990; Pletsch 1988; Johnson, McCarter, & Ferencz 1987; Eriksson, Steneroth, & Zetterstrom 1986; Day, Wagener, & Taylor 1985; Fried, Innes, & Barnes 1984). Serdula et al. (1991) found that, while the overall rate of women who drink during pregnancy declined during the mid-1980s, the rate among less-educated women or those under the age of 25 remained the same.

Effects of Prenatal Exposure to Illicit Drugs

This review is restricted to drugs with a relatively substantial body of research data: cocaine, opiates (primarily heroin and methadone), amphetamine and methamphetamine, phencyclidine hydrochloride (PCP), and marijuana.

Animal models have proved useful for the type of controlled experimental research impossible in humans for methodological and ethical reasons. Such studies have cast much light on issues such as placental transfer of drugs, fetal and intrauterine distribution, fetal drug metabolism, and pharmacological effects (Rudolph 1985) and can provide supporting evidence for clinical findings under experimental conditions (see, for example, Hutchings 1985).

Cocaine

Much of the current research on prenatal exposure to drugs focuses on cocaine. Despite this, the perinatal and developmental effects of such exposure remain topics of controversy.

One study has implicated prenatal exposure to cocaine in an increased risk of stillbirth (Handler et al. 1991). Cocaine's involvement in Sudden Infant Death Syndrome (SIDS), however, remains inconclusive, largely because of the difficulties in controlling for possible confounding factors (Bancalari 1991; Durand, Espinoza, & Nickerson 1990; Ward et al. 1990; Chasnoff et al. 1989c; Bauchner et al. 1988; Riley, Brodsky, & Porat 1988). Some studies have implied that cocaine may be implicated in irregular

neonatal respiratory patterns that may be related to an elevated rate of SIDS (McCann & Lewis 1991; Sylvestri et al. 1991). Other studies question this finding (Zuckerman, Maynard, Cabral 1991; Kelley, Walsh, & Thompson 1991).

More generalized findings associate prenatal cocaine exposure to increased risks of

- *preterm delivery* (Feldman et al. 1992; Cohen, Green, & Crombleholme 1991; Chasnoff 1991; Handler et al. 1991; Spence et al. 1991; Mastrogiannis et al. 1990; Dixon 1989; Cherukuri et al. 1988; Finnegan 1988; Chasnoff, Burns, & Burns 1987; MacGregor et al. 1987)
- *abruptio placentae*, the premature detachment of a placenta (Cohen, Green, & Crombleholme 1991; Dombrowski et al. 1991; Handler et al. 1991; Mastrogiannis et al. 1990; Dixon 1989; Cherukuri et al. 1988; Chasnoff 1985; Acker et al. 1983)
- *meconium staining* (Meconium is a term used to describe the dark green mucilaginous material in the intestine of the full-term fetus.) (Mastrogiannis et al. 1990; Livesay et al. 1988)
- *smaller-than-normal head size and low birthweight* (Coles et al. 1992; Chasnoff et al. 1992; Cohen, Green, & Crombleholme 1991; Dombrowski et al. 1991; Kelley, Walsh & Thompson 1991; McCalla et al. 1991; Handler et al. 1991; Little & Snell 1991; Petitti & Coleman 1990; Burkett, Yasin, & Palow 1990; Fulroth, Phillips, & Durand 1989; Chasnoff et al. 1989a; Zuckerman et al. 1989; Dixon 1989; Cherukuri et al. 1988; Finnegan 1988; Chouteau, Namerow, & Leppert 1988; Livesay et al. 1988; LeBlanc et al. 1987; MacGregor et al. 1987; Oro & Dixon 1987)
- *low scores on the Apgar, which assesses the condition of newborns* (Spence et al. 1991; McCalla et al. 1991; Finnegan 1988)
- *disorganized behavioral states in the prenate and neonate, which may reflect central nervous system damage* (Coles et al. 1992; Magnano, Gardner, & Karmel 1992; Chasnoff et al. 1989; Dixon 1989; Hume et al. 1989; Chasnoff & Griffith 1989; Griffith 1988; Doberczak et al. 1988; Chasnoff, Burns, & Burns 1987)

One study implies that infants exposed to cocaine in utero may have an increased risk of motor dysfunction (Schneider & Chasnoff 1992). Some researchers suggest that prenatal cocaine exposure can increase the risk of intravenicular hemorrhages (Dixon & Bejar 1989). Others maintain that such hemorrhages do not affect cocaine-exposed neonates at rates differing from the general population (Sweidan et al. 1990). Questions also exist concerning the relationship of such hemorrhages to developmental

outcomes (Vohr et al. 1992; Kosofsky 1991; Greenberg & Crnic 1988). Another study of the neurological implications of prenatal cocaine exposure did indicate that exposure may be related to Central Nervous System (CNS) abnormalities (Heier et al. 1991).

Fulroth, Phillips, and Durand (1989) indicated that some babies prenatally exposed to cocaine undergo withdrawal. However, a review of the research by Zuckerman (1991b) concluded that "a withdrawal symptom has not been identified and, therefore, at this time it is inaccurate to describe a cocaine-exposed newborn as crack addicted."

While some studies indicate that the effects of prenatal cocaine exposure (including suspected neurological abnormalities, low birthweight, and the consequences of withdrawal) normalize within the first year after birth (Doberczak et al. 1988; Black & Schuler n.d.), preliminary reports from one longitudinal study found that 30 to 40 percent of a sample of cocaine-exposed children had language development and attention problems through at least their fourth year of life (Griffith 1991, testimony).

The results of the studies summarized in this section are not entirely consistent. Some studies find effects that other studies do not (see, for example, Richardson & Day 1991). At least one study of Canadian social cocaine users found no effects on perinatal outcomes (Graham et al. 1992). Such discrepancies are often attributed to differences in samples, sample size, and the purity and dosage of drugs used by subjects.

A recent commentary in the *Journal of the American Medical Association* concluded that "available evidence from the newborn period is far too slim and fragmented to allow any clear predictions about the effects of intrauterine exposure to cocaine on the course and outcome of child growth and development" and that "significantly, no prospective study of unique long-term consequences of intrauterine cocaine, nonopiate exposure has been published in the peer-review literature" (Mayes et al. 1992). A recent meta-analysis of research on prenatal cocaine exposure came to similar conclusions (Lutiger 1991).

Available evidence from the newborn period is far too slim and fragmented to allow any clear predictions about the effects of intrauterine exposure to cocaine on the course and outcome of child growth and development.

Opiates

While the "crack epidemic" has drawn public attention away from other drugs, heroin remains a widespread social problem. Prenatal heroin exposure is associated with

- *preterm delivery* (Maas et al. 1990; Gregg, Davidson, & Weindling 1988; Finnegan 1988)
- *miscarriages* (Suffet & Brotman 1984)
- *smaller-than-normal head size and low birthweight* (Fulroth, Phillips, & Durand 1989; Zuckerman et al. 1989; Pasto et al. 1988;

Householder et al. 1982; Stimmel et al. 1982)

- *meconium staining* (Pasto et al. 1988; Householder et al. 1982)

Some evidence associates heroin with an increased risk for SIDS (McCance-Katz 1991; Deren 1986; Householder et al. 1982).

The majority of babies born to women addicted to heroin (or on methadone maintenance) suffer from neonatal abstinence syndrome. (McCance-Katz 1991; Mas et al. 1990; Fulroth, Phillips, & Durand 1989; Rosen & Johnson 1985). This condition includes neurologic signs (hypertonia, tremors, sleep disturbances, seizures), autonomic nervous system dysfunctions, gastrointestinal abnormalities, and respiratory problems (Hoegerman & Schnoll 1991).

However, as with much of the research on prenatal drug exposure, many of the cognitive and behavioral effects could result from confounding environmental influences.

Some long-term studies indicate that children prenatally exposed to heroin suffer from below-average weight and length, adjustment problems, and psycholinguistic and other ability deficits through six years of age (and, in Olofsson et al. [1983] through age 10) (Deren 1986; Olofsson et al. 1983; Wilson et al. 1979).

However, as with much of the research on prenatal drug exposure, many of the cognitive and behavioral effects could result from confounding environmental influences. One review of the literature on opiates concluded that: "In general, [the infants of opiate-addicted women] have a number of behavioral disturbances early in life, but lasting cognitive-developmental differences between these children and controls have not regularly been found" (Strauss & Allred 1986).

Studies of prenatal methadone exposure report some association with initial developmental deficits. Researchers have not identified consistent long-term effects of prenatal methadone exposure and speculate that these effects largely depend on a combination of biologic and environmental factors (Rosen & Johnson 1985; Chasnoff 1985; Johnson, Rosen, & Glassman 1983).

Methadone maintenance programs result in improved birth outcomes for addicted women (Maas et al. 1990; Stimmel et al. 1982; Ramer & Lodge 1975). Such programs often include improved prenatal and medical care, as well as improved maternal nutrition, which suggests that some of the consequences of prenatal opiate exposure result from a lack of prenatal care and poor maternal health rather than represent a direct effect of the drug.

Amphetamines and Methamphetamines

Some of the research on the prenatal effects of amphetamines or methamphetamines demonstrates perinatal results similar to those found in studies of cocaine or heroin. However, most researchers express reservations

concerning their inability to control for the effects of variables such as poor prenatal care or foster-care placement (Dixon 1989; Little, Snell, & Gilstrap 1988; Eriksson, Larsson, & Zetterstrom 1981; Billing et al. 1980).

In one study of eight year olds whose mothers had abused amphetamines during pregnancy, Eriksson et al. (1989) did not find any significant differences from children whose mothers had not used drugs, on measures of physical health (including growth), IQ, and performance on psychometric tests. This research team suggested that the differences found (including increased levels of aggression and problems relating to peers) may result from socioenvironmental factors. (See also Little, Snell, & Gilstrap 1988 for a report of no effects.) Thus, although some of the research indicates that prenatal exposure to amphetamines or methamphetamines may have some short-term consequences for the neonate, most of the research on this group of drugs remains inconclusive.

Phencyclidine Hydrochloride (PCP)

The research on prenatal exposure to PCP describes a number of consequences, including intrauterine growth retardation, preterm delivery, neonatal withdrawal, meconium staining, and poor consolability. Neurobehavioral symptoms associated with prenatal exposure to PCP include irritability, tremors, jitteriness, extreme sensitivity to stimuli, poor visual tracking, and hypertonicity (Tabor, Smith-Wallace, & Yonekura 1990; Howard, Kropenske, & Tyler 1986; Golden et al. 1984; Chasnoff et al. 1983; Strauss, Modanlou, & Bosu 1981). With one exception, these studies take the form of case reports with severely limited sample sizes (one to seven infants) and a lack of controls for other variables (most notably, the mother's heavy consumption of other substances).

Marijuana

Much of the research on the prenatal effects of marijuana has associated heavy use with the following:

- *low birthweight* (Zuckerman et al. 1989; Kline, Stein, & Hutzler 1987; Fried et al. 1987; Hatch & Bracken 1986)
- *a shortened gestational period* (Fried, Watkinson, & Willan 1984)
- *meconium staining and complications in delivery* (Greenland et al. 1982)
- *neonatal neurobiological abnormalities* (Lester & Dreher 1989; Fried 1985)

Differences between children of marijuana-using and nonusing mothers often disappear when demographic characteristics and other confounding factors are controlled for (O'Connell & Fried 1991; Linn et al. 1983; Gibson, Bayhurst, & Collry 1983). For example, Fried (1985) found no significant differences

Research implicates alcohol in a wide range of perinatal effects.

between matched marijuana-using and nonusing samples in terms of miscarriage rates, birth presentations, Apgar scores, and frequency of birth complications or major abnormalities. (See also Day et al. [1991] and Abel [1985] for lack of consequential effects.)

Fried and Watkinson (1990) reported that:

> At 48 months, significantly lower scores in verbal and memory domains were associated with maternal marijuana use after adjusting for confounding variables. This negative relationship is the first reported association beyond the prenatal stage, and may represent a long-term effect of the drug upon complex behavior that, at a younger age, had not developed and/or could not be assessed.

Contradictory findings resulting from the research on prenatal exposure to marijuana may arise from an inability to control dosage and the purity (and strength) of the marijuana being used. (See, for example, the discussion of comparative results in Tennes et al. [1985]).

Mixed Samples of Illicit Drug Users

Studies of samples composed of a mix of users of cocaine, amphetamines, methamphetamines, and PCP tend to replicate the generalized findings of studies of individual drugs. Ward et al. (1990) suggested that abnormal sleeping ventilatory patterns in the infants of mothers who abuse alcohol and other drugs may increase the risk of SIDS. However, this study also confirmed the difficulties of eliminating the effects of confounding variables revealed in some of the drug-specific studies. Still, there are other studies that link prenatal substance exposure to respiratory difficulties (McCann & Lewis 1991).

Other adverse effects found in mixed samples include increased rates of low birthweight, small birth size, and signs of neurobehavioral disturbances (Dominquez et al. 1991; Van Baar et al. 1989; Gillogley et al. 1990; Kaye et al. 1989; Dixon & Bejar 1989; Fulroth, Phillips, & Durand 1989; Oro & Dixon 1987; Chasnoff 1985). Some of these studies also seem to substantiate the finding that most consequences of prenatal drug exposure resolve within a year (Van Baar, Fleury, & Ultee 1989; Chasnoff 1985), although some indicated the possibility of longer-term language acquisition difficulties (Van Baar 1990; Rodning, Beckwith, & Howard 1989).

Effects of Prenatal Exposure to Alcohol

Research implicates alcohol in a wide range of perinatal effects including:

- *an increased risk of spontaneous abortion and stillbirth* (Abel 1981)
- *shorter gestation periods* (Hingson et al. 1982)
- *reduced birth size and weight* (Autti-Ramo & Granstrom 1991)

Researchers normally divide the long-term effects of prenatal exposure to alcohol into two categories:

(1) Fetal Alcohol Syndrome (FAS) and (2) Alcohol-Related Birth Defects (ARBD, sometimes called Fetal Alcohol Effects or FAE).

Fetal Alcohol Syndrome (FAS)

In 1973, K.L. Jones, D.W. Smith, and their colleagues realized that a substantial number of children affected by prenatal exposure to alcohol exhibited a characteristic set of facial abnormalities, growth deficiencies, and psychomotor disorders. They labelled this characteristic covariance Fetal Alcohol Syndrome (FAS) (Jones et al. 1973). Since that time, researchers have developed a number of competing diagnostic definitions for FAS (Weiner & Morse 1988; Burd & Martsolf 1989; Clarren & Smith 1978). The Fetal Alcohol Study Group of the Research Society on Alcoholism (Rosett 1980) requires the presence of signs in each of three categories:

- *prenatal and/or postnatal growth retardation* (weight, length, and/or head circumference below the tenth percentile corrected for gestational age)
- *central nervous system involvement* (indications of neurological abnormality, developmental delay, or intellectual impairment)
- *facial abnormalities* (with at least two of the following signs: head circumference below the third percentile; narrow eye slits; flat and long upper lip; underdeveloped midface; and flattened nose bridge)

The FAS facial features described above create a characteristic look that has been described by other researchers as well (Russell 1991; Jessup & Green 1987; Nelson et al. 1990; Umbreit & Ostrow 1980; Overholser 1990; US DHHS 1990; McCance-Katz 1991). While these facial anomalies appear less pronounced over time, deficits and impairments in the other categories do not. Victims of FAS never catch up in size or cognitive ability to their nonaffected peers (Streissguth et al. 1991b; US DHHS 1990; Jessup & Green 1987; Streissguth, Clarren, & Jones 1985; Rosett & Weiner 1984; Iosub et al. 1981; Streissguth, Herman, & Smith 1978a,b; Hanson, Jones, & Smith 1976).

Other physical abnormalities associated with FAS include cardiovascular problems, cardiac murmurs, kidney troubles, respiratory dysfunction, hernias, shortened fingers, and profusion of facial hair (Burd & Martsolf 1989; Holzman 1983; Weiner & Morse 1988). Delayed motor development also characterizes many children with FAS and, in many cases, motor development never normalizes (Sparks 1984; Warren & Bast 1988). Physical abnormalities related to FAS can affect linguistic and cognitive development. Abnormal palates and other oral structures can cause articulation difficulties (Iosub et al. 1981). A significant proportion of children with FAS have impaired vision and/or hearing (Stromland 1987; Streissguth

& Giunta 1988; Church & Gerkin 1988), which can affect learning ability.

Central Nervous System (CNS) disorders related to FAS include acute sensitivity to sound, irritability, little body activity, attention problems, and jitteriness (Pierog, Chandavasu, & Wexler 1977; Streissguth & Giunta 1988).

Cognitive impairments associated with FAS include deficits in the ability to use and comprehend language and process and store information (Becker, Warr-Leeper, & Leeper 1990). Streissguth, Herman, and Smith (1978a,b) found that children with FAS had IQ scores ranging from normal to severely mentally retarded, with a mean score of 65. These scores do not appear to improve over time (Streissguth, Randels, & Smith 1991). FAS may surpass Down syndrome and spina bifida as a leading cause of mental retardation (Abel & Sokol 1987; Abel & Sokol 1986a; CDC 1982; Clarren & Smith 1978; Jones & Smith 1973).

Failure to take account of FAE underestimates the dangers of alcohol use for pregnant women and their children.

Research shows that FAS results from chronic maternal drinking (although not all women who drink heavily during their pregnancy produce children with FAS) (Weiner & Morse 1988; US DHHS 1987; Abel 1985; Streissguth & Martin 1983). The effects of limited social drinking by pregnant women remain a subject of controversy (Autti-Ramo & Granstrom 1991; Russel 1991; Overholser 1990; Ernhart et al. 1989; Warren & Bast 1988; Jessup & Green 1987; Abel 1984; Lochry et al. 1982; Edwards 1979).

Alcohol-Related Birth Defects (ARBD)/Fetal Alcohol Effects (FAE)

Researchers have estimated that, among the children prenatally exposed to alcohol, the number suffering potentially severe developmental effects without diagnostic signs of FAS is twice the number of those with FAS indicators (Streissguth & Giunta 1988; Weiner & Morse 1988). These effects include alcohol-related physical features (alcohol dysmorphia), growth retardation, and various cognitive deficits (Coles et al. 1991) and may represent the effects of lower levels of alcohol consumption by the mother, different usage patterns, the influence of confounding factors, and/or genetic differences in susceptibility.

Failure to take account of FAE underestimates the dangers of alcohol use for pregnant women and their children. Barr et al. (1990) found that prenatal exposure to alcohol affected fine and gross motor performance at four years of age. The same research team discovered that social and binge drinking "predicts a pattern of neurobehavioral deficit that includes attention and memory deficits . . . a variety of 'process' variables reflecting poor integration and quality of responses; behavior patterns involving distractibility and poor organization; and an inflexible approach to problem solving

(Streissguth et al. 1989 a,b; See also Sampson et al. 1989). This research also revealed that consumption of an average of two drinks a day by pregnant women was related to a seven-point decrease in IQ at age seven. However, they noted that environmental factors were associated with outcomes and "these patterns should not be interpreted as biologic thresholds" (Streissguth, Barr, & Sampson 1990).

Preterm and Small-for-Gestational-Age (SGA) Birth

The research shows that:

Low birthweight is the most frequent and clearly documented adverse outcome associated with gestational exposure to narcotics and other toxic addictive substances including nicotine, alcohol, marijuana, and cocaine. While decreased birthweight can be attributed primarily to impaired fetal growth, an increased occurrence of premature birth, as reported with maternal use of heroin and cocaine, may also play a role (Lifschitz & Wilson 1991).

If prenatal exposure to alcohol or other drugs elevates the risk of preterm or small-for-gestational-age (SGA) birth, then it also elevates any consequent perinatal or developmental risks.

Risk Factors for Preterm and SGA Birth

Many factors in addition to drug and alcohol consumption contribute to an elevated risk of preterm and SGA births. These include stress, low weight, age, inadequate prenatal care, hypertension, poor nutrition, and smoking (National Commission to Prevent Infant Mortality 1990; Hughes et al. 1988; National Center for Health Statistics 1988; Samuels 1986). Except in extreme cases (such as chronic malnutrition), the interaction and complexity of these risk factors makes it difficult to identify an individual cause for specific cases of preterm or SGA birth (Cassady & Strange 1987; Holmes, Nagy Reich, & Pasternack 1984).

Many factors in addition to drug and alcohol consumption contribute to an elevated risk of preterm and SGA births.

The 1980s saw an increase in the risk factors that contribute to preterm and SGA birth. The percentage of women who received no prenatal care increased by half. The number of infants born to unmarried women rose by 40 percent (National Commission to Prevent Infant Mortality 1990). The National Commission to Prevent Infant Mortality concluded that the concentration of extreme poverty, drug use, inadequate health care, and other factors have turned some communities into "infant mortality disaster areas" (National Commission to Prevent Infant Mortality 1990).

Prenatal care can reduce the risks of preterm or SGA birth even in the presence of these risk factors (Hughes et al. 1988). As Margaret Boone (1989) wrote in her study of infant mortality and morbidity in America: "Prenatal care emerges as a critical element.... The inner-city women who obtain care clearly have infants with higher birthweight than women who do not get care, regardless of any other characteristics."

Evidence also exists that improved prenatal and neonatal care can alleviate many of the effects of prenatal drug or alcohol exposure.

Evidence also exists that improved prenatal and neonatal care can alleviate many of the effects of prenatal drug or alcohol exposure (Broekhuizen, Utrie, & Van Mullem 1992; Feldman et al. 1992; Randall 1991; Greene et al. 1991; Griesbach & Polloway 1990; MacGregor et al. 1989; Finnegan 1988; Bingol et al. 1987; Fitzsimmons et al. 1986; Suffet & Brotman 1984; Rosner, Keith, & Chasnoff 1982). However, women who abuse drugs and alcohol tend to receive less prenatal care than others (Abma & Mott 1991; McCalla et al. 1991; Kelley, Walsh, & Thompson 1991; Burkett, Yasin, & Palow 1990; Matera et al. 1990; Dixon 1989; Keith, MacGregor, & Sciarra 1988; Cherukuri et al. 1988).

Perinatal and Long-Term Risks Associated with Preterm and SGA Birth

Infants born too soon or too small can face serious and fatal threats, including elevated risks of Respiratory Distress Syndrome, intrauterine hypoxia, birth asphyxia, perinatal infections, and Sudden Infant Death Syndrome. Low-birthweight infants die in the neonatal period at a rate 40 times that of other infants and represent two-thirds of all neonatal deaths in the United States (Samuels 1986; also see Overpeck, Hoffman, & Prager, [1992]). Other perinatal risks associated with preterm and SGA birth include nutritional disturbances, intraventricular hemorrhaging, and meconium staining (Werthmann 1981). All of these risks have also been attributed to prenatal drug or alcohol exposure and demonstrate the difficulty of determining the precise causal linkages between prenatal risk factors and postnatal status.

Some evidence exists that preterm and SGA birth (especially in cases of very low birthweight) can result in subtle cognitive and language acquisition delays and impairments and differences in IQ (Hack et al. 1991; Largo et al. 1986; Aylward et al. 1989; Wilson 1985; Cohen & Parmelee 1983; Hunt 1981). Whether these differences mean anything in terms of a child's actual linguistic and cognitive abilities remains unclear. Some studies indicate that preterm and very SGA birth can have consequences throughout childhood (Smedler et al. 1992; McCormick et al. 1992; Menyuk et al. 1991; Hoy et al. 1992; Seidman et al. 1992; Lagerstrom et al. 1991a; Lagerstrom et al. 1991b; Ross, Lipper, & Auld 1991; Lagerstrom et al. 1991c; Hack et al. 1991; Saigal et al. 1991). Most studies agree that preterm and SGA birth have little, if any, long-term effects on intelligence, language skills, or temperament (Casiro, et al. 1991; Ludman et al. 1987; Wilson 1985; Greenberg & Crnic 1988; Menyuk et al. 1991; Watt 1987; Riese 1988; Oberklaid, Prior, Sanson 1986). Sameroff (1981) concluded that:

> The single most potent factor influencing developmental outcome turns out to be the cultural environment of the child, as expressed in socioeconomic status and parental education level.... In all the studies there was a significant overlap between the

outcomes for the preterm groups and the control groups. No single factor, either birthweight alone or accompanying physical problems, clearly predicted a specific developmental outcome.

Another review stated that "the major biological markers of prematurity made little direct contribution in predicting their later developmental status" (Greenberg & Crnic 1988). The fact that early postnatal intervention can make major differences in the developmental outcomes of preterm and SGA infants (Brooks-Gunn, Liaw, & Klebanov 1992; Infant Health and Development Program 1990; Achenbach et al. 1990) provides additional evidence for the strength of environmental, rather than biologic, factors.

Social factors can predict the long-term developmental performance of preterm and SGA children better than biologic indicators (Carter et al. 1992; Cohen et al. 1986; Cohen & Parmelee 1983). The poor suffer the consequences of vulnerable birth status more than those of higher income. The developmental deficits that normalize by school age in most children tend to persist longer in those from low-income families (Largo et al. 1986; Wilson 1985). Beckwith (1984) found that the developmental scores of preterm children born to middle-class families and families of higher socioeconomic status improved as the child progressed to school age, while those of lower socioeconomic status children actually declined. This decline may be associated with biologic risks in the infant's postnatal environment, such as inadequate nutrition, lead poisoning, and lack of access to health care. However, the research also shows that preterm or SGA birth itself affects an infant's relationship with its parents in ways that have developmental consequences.

Preterm and SGA Birth and Parent-Child Interaction

Beckwith (1984) identified three elements essential for normal infant development:

- verbal interaction
- mutual visual regard
- parents' rapid response to the infant's indication of stress

A lack of such stimulation and interaction can have profound consequences for cognitive and linguistic development (Holmes, Nagy Reich, & Pasternack 1984; Cohen, Beckwith, & Parmelee 1978; Rocissano & Yatchmink 1983). Infants behave in ways that stimulate caretakers to pick them up, cuddle them, and provide verbal interaction, mutual visual regard, and response to stress. But babies born preterm, SGA, or with the neonatal abstinence syndrome often undergo extensive stays in hospital neonatal intensive care units and cannot interact easily with their caregivers (Mundal et al. 1991).

The high-risk infant is forced to spend his initial weeks or months in an environment that is not only overstimulating, but

disorganized. It is an environment characterized by few contingencies between the behavior of the infant and environmental response.... There are many reasons to believe that such an environment is far from optimal for infant development and may be responsible for some of the behavioral deficits observed in these children (Holmes, Nagy Reich, & Pasternack 1984).

Like many of the other factors that can delay neonatal development, the effects on the infant of a stay in a neonatal intensive care unit seem to dissipate after six months. However, the effects of this experience on parents seem longer-lived. Spungen and Farran (1986) concluded that a stay by a preterm infant in a neonatal intensive care unit "was more pervasive on parents' perceptions of their infants" than on the infants themselves. Seeing a very small and fragile-looking infant hooked to a maze of wires and tubes in an incubator may frighten parents. They resist emotional involvement with a child who they believe may suffer some irreparable damage. Their perception of the child's fragile condition may result in a reluctance to pick up the infant unless absolutely necessary (Holmes, Nagy Reich, & Pasternack 1984).

Preterm babies sleep more than fullterm babies. This allows them to complete some of the development that should have taken place in the womb. However, while asleep they do not demand the attention and interaction necessary for normal development (Holmes, Nagy Reich, & Pasternack 1984).

Having a preterm or SGA infant places a great deal of stress upon parents, especially mothers. They need higher levels of formal and informal support than other parents (Affeckt 1986). The presence or absence of this support can have critical consequences for parental interaction and child development.

Crnic, Greenberg, and Slough (1986) found that "early stress was associated with less positive maternal attitudes and mother-infant interactive behavior, as well as less secure infant attachment to the mother." They also found that "intimate support provided by the mother's spouse or partner was the most powerful predictor with the greatest breadth of effect across both mother and infant functioning" and that professional support has profound consequences for parenting and infant development.

Mothers of preterm and SGA infants often receive increased levels of support from husbands, relatives, friends, and medical professionals. However, single, poor women often lack such a support system (Beckman et al. 1986). Thus, the same group of women faces both an elevated risk of giving birth to a preterm or SGA infant and an increased chance that postnatal factors will compromise the child's long-term developmental status. Research indicates that the presence or absence of such support can be critical for family-child relations and child health outcomes (Saylor, Lippa, & Lee 1991).

Conclusion

While precise data is lacking, it appears that a fairly substantial number of women use alcohol and other drugs during their pregnancies. Many of these women face additional biologic risks to the health of their babies because of inadequate prenatal care and other risk factors associated with poverty and chronic abuse of alcohol and other drugs.

Methodological challenges make it difficult to investigate the consequences of prenatal drug and alcohol exposure. The research has demonstrated that:

- The use of alcohol during pregnancy can lead to Fetal Alcohol Syndrome (FAS) and other permanent physical and cognitive defects.
- Heroin, and possibly other illicit drugs, can result in the neonatal abstinence syndrome. While the long-term effects of this condition remain uncertain, it places substantial stress on both the infant and parents and requires extensive and expensive medical care.
- Prenatal exposure to alcohol or other drugs may contribute to a risk of other adverse perinatal outcomes and developmental delays. The extent of this contribution and the duration of these delays remain uncertain.
- Prenatal exposure to alcohol or other drugs can contribute to preterm and small-for-gestational-age (SGA) birth. Other factors that elevate the risk of preterm and SGA birth tend to concentrate in those sociodemographic groups that also have an elevated risk of prenatal drug and alcohol exposure.
- Preterm and SGA birth associated with, or independent of, prenatal drug or alcohol exposure can have developmental consequences. Socioeconomic factors, and especially the extent of prenatal care, predict the extent of these consequences far better than biologic birth status.

The risks to infant development do not end with the neonatal period.

The risks to infant development do not end with the neonatal period. As Chasnoff et al. (1992) wrote:

> The long-term effects which will be found within the general population of drug-exposed children will not be explained by drug exposure alone. Before we can predict the developmental outcomes for these high-risk children we need further research into the additive and interactive effects of the multiple risk factors to which they are exposed, including in many cases the global effects of poverty, multigenerational substance abuse, and the impact of growing up in a drug-seeking environment.

The next chapter of this monograph will explore these multiple risk factors and their effects on child development.

CHAPTER 2

Environmental Risks and Implications for Development

As seen in the previous chapter, research evidence on the developmental effects of prenatal drug exposure is sparse, but recent evidence indicates that drug-exposed children are generally not as impaired as early reports had predicted. Drug exposure is only one of many factors that may negatively affect a child's development.

Researchers and scholars have been steadily moving toward an ecological approach to understanding the complex factors that contribute to child development (Belsky 1980; Bronfenbrenner 1979; Gabarino 1990; Kaltenbach & Finnegan 1984; Sameroff & Chandler 1975; Sameroff & Fiese 1990). The complex interaction of individual, family, environment, and community is most evident when one attempts to understand the dynamics of alcohol and other drug abuse, particularly as they affect children.

Researchers widely recognize that, as Dr. Barry Zuckerman states, "The outcome of children of heavy drug-using parents is due to the dynamic interaction of the child and the social environment" (Zuckerman 1991a). Practitioners, too, are keenly aware of the environment and its influence on children's development. "Parents in prison, inadequate health care and parenting skills, abuse and neglect, and multiple foster placements are among the many environmental factors that children encounter. How can we possibly say that these children's behaviors are a direct result of the prenatal drug exposure?" asks Carol Cole, former teacher in the PED (Children Prenatally Exposed to Drugs) Program in Los Angeles.

To fully understand the effects of exposure to drugs on children, it is essential to examine the environmental factors present in at-risk communities. Below is a review of literature that addresses the nature of the

caregiving environment in families in which alcohol and other drugs are abused, the effects of foster care, and the known developmental consequences of child abuse and neglect.

Children, Poverty, and Violence

More children live in poverty than ever before. Between 1979 and 1989, the number of poor children under age six increased by 46 percent, even though the total population of six year olds remained relatively stable. The picture is even bleaker for children of color. Half of all black children under six and 40 percent of all Hispanic children under six are poor. Thirty percent of children in central cities are poor. Of these, 61 percent live in areas of concentrated poverty (National Center for Children in Poverty 1991).

It is in the poor, inner-city communities that much of the client base exists for the programs that currently report new and troubling behaviors among their children. But even more disruptive are two interrelated environmental stresses to which children growing up in at-risk neighborhoods are exposed: drug trafficking and violence.

The relationship between violence and poverty has been thoroughly documented (Williams 1984; Centerwall 1984; Loftin & Hill 1974; Parker & Smith 1979; Wilson 1987). Urban areas, especially inner cities, tend to have much higher rates of interpersonal violence than do rural and suburban communities (American Psychological Association 1993). Areas that are both poor and urban are thus in double jeopardy.

Alcohol and other drugs play a major role in the levels of violence that exist in these communities. At least half of all the perpetrators and victims of homicides in America have been drinking, and a large percentage of violence occurs in places where alcohol is consumed (University of California/Centers for Disease Control 1985).

One consequence of drug use and drug traffic is the high rate of associated neighborhood crime (Gropper 1985). The National Institute on Drug Abuse estimates conservatively that at least 10 percent of homicides and assaults in the United States are drug related (Harwood et al. 1984). Other studies have demonstrated that violent crime and drug abuse tend to occur in the same neighborhoods; also, users of certain types of illicit drugs tend to be arrested for serious crimes against persons at a far greater rate than do persons who do not use those drugs (McBride et al. 1986). Sixty percent of those arrested in Washington D.C. in 1988 tested positive for cocaine and 40 percent for PCP (Molotsky 1988).

Because drugs such as heroin and cocaine are both illegal and valuable, their marketing involves considerable violence: violence among drug dealers over turf, violence between dealers and their customers over price

Living with the fear of violence in school, in neighborhoods, and at home takes its toll on the development of children, even if they have not been physically injured.

and quality, violence between dealers and those who see them as robbery targets, and violence among drug users over drugs.

Effects of Violence on Children's Development

From an early age, children in at-risk neighborhoods witness violence and crime close to home. Living with the fear of violence in school, in neighborhoods, and at home takes its toll on the development of children, even if they have not been physically injured.

Dr. Barry Zuckerman describes the symptoms that may emerge in children who witness violence: "a diminished ability to concentrate in school because of intrusive thoughts and images; persistent sleep disturbances; disordered attachment behaviors with significant caretakers; nihilistic, fatalistic orientation to the future which leads to increased risk-taking behaviors" (Zuckerman 1991a).

While not enough research has been done on the extent to which preschool-aged children in inner-city neighborhoods are aware of this violence, anecdotal evidence and some studies have shown that it does not go unnoticed by older children. A study of fourth through sixth graders from low-income neighborhood schools in Washington D.C. revealed that almost 30 percent had witnessed at least one incidence of community violence. Almost 16 percent had witnessed shootings and over a quarter had witnessed gang violence. Forty percent of the parents said that their children had witnessed at least one violent episode (Hill 1991).

Twenty-four percent of 168 Baltimore adolescents visiting an inner-city clinic for routine medical care had witnessed a murder, 72 percent knew someone who had been shot, and all had been victims of violence (Zinmeister 1990). Ninety percent of children using the psychiatric clinic at the King/Drew Medical Clinic in South-Central Los Angeles have witnessed violence (Timnick 1989).

The available evidence indicates that such violence can take a toll upon the development, behavior, and emotional well-being of children who are exposed to it. Children in violence-infected neighborhoods have begun to display the symptoms of post-traumatic stress disorder, including depression, violent outbursts, difficulty concentrating, and reduced involvement in the outside world (Pynoos & Eth 1985; Kristal 1982; Landers 1990). Research has begun to document the effects of witnessing violence on child development, which include impaired cognition, memory and learning disorders, and poor school performance (Garbarino, Kostelny, & Dubrow 1991). These effects bear a striking resemblance to those often attributed to prenatal drug exposure.

Families in Which Alcohol and Other Drugs Are Abused: The Caregiving Environment

Whether or not they live in at-risk communities, children who live in families abusing alcohol and other drugs are exposed to more immediate risks. The quality of the caregiving environment, reflected in family discord, stability, and status, has been related to children's development in study after study (Sameroff, Barocas, & Seiffer 1984; Goldstein & Tuma 1987). Emerging research on resiliency suggests that neither prenatal exposure to drugs nor poverty can, in itself, predict the developmental outcomes (Werner 1990; Johnson et al. 1990; Leif 1985). However, without support and intervention, the prospects for children from families in which alcohol and other drugs are abused are not promising.

Substance Abuse and the Ability to Fulfill Parental Roles

Many factors detract from the capacity of women abusing alcohol and other drugs to be the kind of mothers they want to be. Howard (1989) found that many women who abuse drugs and/or alcohol were themselves victims of physical, sexual, and emotional abuse as children. Among the 58 women Howard studied, 72 percent had been physically and/or sexually abused, 66 percent came from households where one or both parents used drugs, 55 percent had multiple caretakers while growing up, and over 74 percent experienced violent episodes during their lifetimes.

Substance abuse results in behaviors that are in conflict with secure and nurturing caregiving: social isolation; poor coping skills; and difficulty in managing finances, accessing community resources, making child-care arrangements, or pursuing vocational and educational activities (Leif 1985; Zuckerman 1991a; Pearlman et al. 1982; West & Dalton 1982). Some research has tied alcohol and drug abuse directly to an increased risk of child abuse and neglect (Wright et al 1991; Rose 1991).

Child-Rearing Challenges and Parents' Behaviors

The challenges begin even before the hospital stay is over. Faced with a "difficult baby" at birth, mothers may be upset by the child's high-pitched cries, restlessness, irritability, spitting up, and need for frequent feedings. Once home, children "often experience inconsistent parenting, with their mother behaving one way when she is high and another when she is straight" (Leif 1985). Parents may ignore an infant's signals for stimulation and nutrition, as they lack an understanding of children's needs for routines in daily life. As researchers from the Family Center at Jefferson Medical College note, "If a woman is using additional drugs [other than methadone] which have a soporific effect, she may neglect to feed her child on time, keep

an infant dry and clean, and if, at the time, she is withdrawing, she may also be irritable and abusive" (Regan, Ehrlich, & Finnegan 1987).

Parents who abuse alcohol and other drugs may also lack practical skills such as reading a thermometer, administering medication, and preparing nutritious meals (Howard 1989; Leif 1985; Zuckerman 1991a, 1991b; Howard & Kropenske 1990; Fiks, Johnson, & Rosen 1985). They often have difficulty learning the importance of interacting with their child and are often unaware of the child's psychological needs. Their lack of understanding of child development can lead to unrealistic expectations. For example, they may interpret a toddler's eager exploration of the world as "misbehaving." These unrealistic expectations can generate rigid rules and a negative style of interrelating with their children (Bauman & Levine 1986).

With support, many mothers can retain custody, prove themselves capable of learning about developmental issues, and respond to the needs of the growing infant.

The effects of poor childrearing skills can produce and/or amplify the types of developmental consequences associated with prenatal drug exposure (Sher et al. 1991; Kronstadt 1991; Johnson, Boney, & Brown 1990-1991; Burns & Clark 1991; Johnson & Rosen 1990; Howard 1989; Howard et al. 1989; Griffith 1988; Jeremy & Bernstein 1984; Bauman 1980; Leif 1985).

It is a mistake, however, to conclude that all mothers who use alcohol and other drugs uniformly provide inadequate care. As Leif reports, "The stereotyped image of the inadequate addict parent is not necessarily the true picture." With support, many mothers can retain custody, prove themselves capable of learning about developmental issues, and respond to the needs of the growing infant. Unfortunately, without the intensive support needed, many are unable to care for their own children.

Foster Care

Many infants who are prenatally exposed to drugs never go home with their parents and are placed in the foster care system at birth. In a study of 10 hospitals, an estimated 1,200 of the 4,000 drug-exposed infants born in 1989 were placed in foster care (GAO 1990). Even if drug-exposed infants remain in the care of their families after birth, many enter the social services system later, because of the chaotic and often dangerous environment associated with parental drug abuse (GAO 1990).

There has been a dramatic rise in the number of foster care placements coinciding with the rise of crack cocaine use in the mid- and late-1980s. The estimated demand for foster care nationwide increased 29 percent between 1986 and 1989; however, the demand for placement for children under age 6 rose approximately 40 percent (GAO 1990). There have been regional reports that indicate increases in foster care placements by 80 to 235 percent since 1985 (State Interagency Task Force on Perinatal Substance Abuse 1991; Norris 1991).

Infants living with caretakers who abuse substances face a special set of vulnerabilities and risks. According to the U.S. House of Representatives Select Committee on Children, Youth and Families, "Increasing numbers of infants are being born drug-exposed, placing them at particular risk of the multiple problems that lead to out-of-home care" (Report of the Select Committee 1989). Families abusing alcohol and other drugs, whose children are placed in foster homes, are more likely than other families with children in foster care to include mothers with less education, to be poorly housed, and to receive Aid to Families with Dependent Children (AFDC) prior to placement (Walker, Zangrillo, & Smith 1991). Additionally, children from families in which alcohol and other drugs are abused are more likely to enter the foster-care system at a younger age than those placed from the general population. The median age of children placed in foster care because of parental drug abuse is 4.7 years, as compared to 7.5 years for other children (Walker, Zangrillo, & Smith 1991).

Children from homes in which substance abuse occurs may be at higher risk for multiple foster-care placements. These children often exhibit difficult and frustrating behaviors, requiring greater skills and caretaking on the part of foster parents. Long-term, single placements are uncommon for most children in foster care. However, children who have the constellation of behavioral problems frequently associated with families in which substance abuse occurs seem to be harder to place and at higher risk for multiple placements. Pamela Osnes, director of the Carousel Preschool Program in Tampa, Florida, described a child, two and a half years old, who had already been in 15 placements at the time of entry into an early intervention program. While this specific case may be extreme, another practitioner, Carol Cole, reported that children in the PED Program in Los Angeles average five or six foster care placements before they are school age.

Children from homes in which substance abuse occurs may be at higher risk for multiple foster-care placements.

Consequently, infants from families in which alcohol or other drugs are abused can represent a special challenge to the foster-care system. According to a recent report by the National Black Child Development Institute (Walker, Zangrillo, & Smith 1991), our nation's child welfare system is inadequate and is not effectively "coping with the problems and magnitude of maternal drug-related cases coming into the system. This is illustrated by low discharge rates, low rates of reunification with biological parents, low rates of adoption, infrequent parent-child and parent-caseworker visiting, and inadequate services essential for reunification." It is interesting to note, however, that one study comparing adoption outcomes found that parents adopting drug-exposed children were just as satisfied with their children as were parents adopting children

who had not been exposed in utero (Barth 1991b). This suggests that parent characteristics may have a greater effect upon parent-child relations and child behavior than drug exposure.

The need for family services is especially important when one considers that a fairly high proportion of children are returned to foster-care placements after reunification with their biological parent(s); 32 percent of children previously placed in foster care reenter the social services system, as compared to only 2 percent of children who are adopted (Stein 1987). Research has shown that reunification is twice as likely for parents who do not use drugs as compared to parents who do (Walker, Zangrillo, & Smith 1991). The probability of reunification also decreases over time (Goerge 1990; Fanshel & Shinn 1978). "On discharge indicators [discharge from the foster-care system], it was the children of drug-abusing parents who fared worse. These cases showed (1) fewer discharges overall; (2) much less frequent reunification with the biological parent; (3) more adoptions, but so few as to be insignificant; and (4) in New York, earlier returns to care after discharge ... half returned within four months" (Walker, Zangrillo, & Smith 1991).

Overall, children from families in which alcohol and other drugs are abused are at especially high risk for placement in an alternate care setting (Kelley 1992; Regan, Ehrlich, & Finnegan 1987). The overwhelming proportion of children in foster care are there because the courts have judged them to be abused or neglected. Child abuse and neglect also intersect with the other risk factors described: prenatal exposure to drugs and alcohol, premature birth, inadequate parenting skills, and foster care. And like these other risk factors, abuse and neglect can also play a critical role in how children develop and behave.

Child Abuse and Neglect

Between 1984 and 1989, there was a 3,000 percent increase in the number of drug-related abuse/neglect petitions in the U.S. juvenile courts. Today, 22 states report that chemical dependency is now a dominant factor in child protective custody cases (Longino 1991).

For society as a whole, reports of child abuse and neglect have been rising at an alarming rate for the past five years. In 1989, there were 2.4 million reports of child abuse and neglect throughout the United States (National Committee on the Prevention of Child Abuse 1990). This represents a 30 percent increase over reports made in 1986 (USDHHS 1988). According to the Study of National Incidence and Prevalence of Child Abuse and Neglect, an estimated 1.5 million children were maltreated in 1986. Of these, 63 percent (or about 1,003,600 children) were neglected and 43 percent (or about 675,000 children) were abused (USDHHS 1988). Below, the variety of risk factors that contribute to

the maltreatment of children is explored. This is followed by a section summarizing the results of prospective, longitudinal research that has examined the learning and behavioral consequences of abuse and neglect on young children.

Family and Maternal Risk Factors

Researchers' understanding of child maltreatment has moved away from a belief in a single cause toward a conceptual framework that takes into account the ongoing interaction between the individual characteristics of parents and children, the psychosocial environment of the family, and the stresses or support for families within the broader community and society-at-large (Bronfenbrenner 1979; Belsky 1980; Cicchetti & Rizley 1981). The previous section examined some of the powerful stresses that exist in at-risk urban communities and their contributions to psychosocial and later learning problems experienced by children who live in them. Below, additional risk factors for families, mothers, and children that can increase the danger of child abuse and/or neglect are explored.

Publicity concerning the tragic death of Lisa Steinberg in New York in 1987 and the trial of her father, an attorney, have helped to dispel some of the myths held about child abuse. This case and others like it illustrate that abuse does not occur only in families that live in poverty. While anyone is potentially a child abuser, the dynamics of poverty place an enormous strain on families, so that even the healthiest of individuals may be affected. As Zigler and Hall (1989) state, "No longer do we believe that being poor 'causes' child abuse. Rather, the scant educational, economic, and social network resources that so often accompany being poor in America are the variables that contribute to an increased likelihood of abuse." The impact of poverty on a family's ability to cope is illustrated by statistics from the National Center for Children in Poverty (NCCP). NCCP reports that abuse is seven times greater in families with incomes below $15,000 than in those with higher incomes (Levine 1990).

Unemployment has long been associated with child abuse and spouse abuse (Galdston 1965; Gelles 1973; Gil 1970; Light 1973; Steinmetz & Straus 1974; Gabarino & Crouter 1978). In addition to the material deprivation that unemployment can cause, some have postulated that it also contributes to feelings of low self-esteem, frustration, and isolation. Bugental, Mantyla, and Lewis (1989) suggest that these effects on the family can be significantly amplified by a lack of social supports.

Moreover, families in which child abuse occurs often have violent or conflict-ridden relationships (Burgess & Conger 1978; Lahey et al. 1984; Lorber, Felton, & Reid 1984; Straus 1980). As discussed earlier in this section, parents who abuse alcohol and other drugs are more apt than others to

witness and be involved in violent acts within and outside of the home. Children in homes where substances are abused are likewise at higher risk for witnessing or experiencing violence (Bandura 1973).

The psychosocial functioning of the parent can affect that parent's ability to provide a nurturing and safe environment for children.

The psychosocial functioning of the parent can affect that parent's ability to provide a nurturing and safe environment for children. Mental illness, such as chronic depression, can make it difficult for parents to sustain meaningful interaction with their children. Depressed parents may be emotionally distant and unavailable to their children and unsuccessful in controlling their children's behavior (Orroschel, Weissman, & Kidd 1980; Weissman & Paykel 1974; Regan, Ehrlich, & Finnegan 1987). Such parental attributes are correlated with an elevated risk of child neglect or abuse.

A number of factors render a child at an elevated risk for abuse, especially when parents are subject to other stresses and lack social support. Preterm babies can be difficult to comfort, have a high-pitched cry, and appear unresponsive to parents (Egeland & Brunnquell 1979; Frodi et al. 1978; Parke & Collmer 1975; Vietze, O'Connor, & Altmeier 1982). Parents often must learn to modify the stimulation they provide to help the infants make gains (Field 1983; Als et al. 1986).

Children with disabilities (cognitive and physical) and those with behaviors that are difficult to manage have also been considered to be at elevated risk for child abuse (Terr 1970; Kempe 1971; Morse, Sahler, & Friedman 1970; Baldwin & Oliver 1975; Johnson & Morse 1968; Herrenkohl & Herrenkohl 1979, 1981; Herrenkohl, Herrenkohl, & Egolf 1983).

While there is no question that some children are more difficult to raise than others, reviews of the literature call into question the direct relationship between specific child characteristics and maltreatment (Starr et al. 1984; Brachfield, Goldberg, & Sloman 1980; Sameroff & Chandler 1975). "These reviews and observational studies are in agreement in noting the power of parental responsiveness and the caretaking milieu in overcoming early developmental difficulties as well as the inability to predict that these children will be maltreated simply on the basis of their own characteristics or behavior" (Pianta, Egeland, & Erickson 1989).

Developmental Consequences of Child Maltreatment

Research has clearly documented that the harmful consequences of child maltreatment persist through early childhood into adolescence and adulthood (Erickson, Egeland, & Pianta 1989). In recent years, investigators have adopted both clearer definitions of abuses and, with a developmental perspective, have begun to examine the specific developmental and learning sequelae of child maltreatment.

Clinical observations and prospective studies shed the most light on the variability of children's responses to maltreatment. Among these is the Minnesota Mother-Child Interaction Project. Instituted at the University of Minnesota in 1975, the project was specifically designed to develop an integrative model for examining the antecedents of child maltreatment (Pianta, Egeland, & Erickson 1989). Minnesota researchers have conducted longitudinal, prospective studies that have begun to isolate the varied effects of different types of maltreatment over the course of a child's development from infancy to early school years. Their findings are highlighted below.

Physically Abused Children

Pianta, Egeland, and Erickson's (1989) longitudinal study indicated no significant differences between children who were physically abused and non-abused children until the age of 18 months. At this time infants who were abused began to display signs of insecure attachment that were higher than normal. By two years of age, abused children were angry and frustrated and could be described as noncompliant. Their overall scores on the Bayley Scales of Infant Development were lower than those of their non-maltreated peers. Over the preschool years, researchers noted increasing negative affect among the abused children, finding also that these children lacked control and exhibited little creativity in problem solving.

By kindergarten, they scored lower on the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) (vocabulary, comprehension, and block design) and were more impulsive, creating classroom disturbances. Their teachers described them as extremely inattentive, unpopular, and aggressive. It is interesting to note that the Minnesota longitudinal study found many of the same results for children who experienced hostile verbal abuse as for those who were physically abused.

Crittenden (1989) hypothesizes that abusive parents have high achievement expectations for their children and tend to view relationships in terms of control and coercion. Children can react differently to high and often unrealistic parental demands, with the abuse resulting from "non-compliance." Some children anticipate parental demands and become high achievers to avoid abuse. Others become defiant, taking no responsibility for their own or their parents' behavior. Children who become the focus of concern are usually those who respond by being non-compliant and hypervigilant about their relationships with other adults such as preschool and primary school teachers.

Sexually Abused Children

Sexual abuse—whether one incident or repeated incidents over time—requires children to make social,

psychological, and cognitive adjustments in order to survive. How these adjustments are made has a lasting effect on development (Hartman & Burgess 1989). Sexually abused children may manifest symptoms of the abuse in several different ways. Physical responses to sexual abuse in children may include headaches, stomachaches, changes in appetite, and urinary tract infections. Psychologically, sexually abused children may be unable to concentrate and appear preoccupied, depressed, and less involved or less interested in activities. They may also be anxious around strangers and more anxious or angry in general. Behaviorally, children may respond to sexual abuse by acting out sexually, becoming clingy or withdrawn, or being hyperactive. The emergence of phobias or fears may be especially notable (Tufts-New England Medical Center 1984).

Sexual abuse also has implications for children's behavior in the classroom. Research has indicated that sexually abused children often have a poorer comprehension of daily school tasks, cause more classroom disturbances, and are generally less involved in classroom activities. Sexually abused children are also more likely to make irrelevant responses in class, be less attentive, and appear more nervous and anxious.

Teachers have rated these children as having a strong need for approval, engaging in more help-seeking behaviors, and having poor overall social-emotional adjustment. Teachers have also described sexually abused children as impulsive and dependent, with behavior ranging from withdrawn to aggressive. In general, they are not well-liked by their peers (Erickson, Egeland, & Pianta 1989).

Neglected Children

Children who were neglected generally proceeded down a somewhat different path. By the age of nine months, they received significantly lower scores on the Bayley Scales of Infant Development and by one year of age, they showed signs of being anxiously attached to their mothers. At two these neglected children had poor coping strategies, lacked enthusiasm, were frustrated when presented with problem-solving tasks, and displayed anger and resistance. At three and one-half years of age, these children were characterized by researchers as having very poor impulse control and being inflexible in their approach to solving problems. When presented with a task, neglected children were very distractable and withdrew. Perhaps most striking is the report by observers that more than all other groups of maltreated children, neglected children appeared the "most unhappy." In preschool settings, neglected children between the ages of four and one-half and five were highly dependent on teachers and exhibited adjustment problems.

In kindergarten, they had difficulty understanding the day-to-day demands

placed on them, and they had poor work habits. Teachers characterized them as anxious, withdrawn, unpopular, and inattentive. On the WPPSI, neglected children scored much lower on vocabulary and comprehension, and within the daily routine they had difficulty in acquiring reading skills.

Crittenden (1989) hypothesizes that the early lack of exposure to stimulus and response in the caretaking environment leads to a basic lack of understanding of cause and effect. Once neglected children can move about on their own, they are overactive in their exploration of the world. However, without adult supervision or facilitation, their explorations are disorganized, uncontrolled, and often dangerous. Later, as they enter school, neglected children can appear reckless, inattentive, and lacking in social competence. A disturbing characteristic ascribed to neglected children is that they treat others as objects—"pushing them out of the way as if they are chairs or grabbing toys from them as if they are shelves" (Crittenden 1989).

Erickson et al. (1989) report a teacher's description of a six-year-old victim of maltreatment:

> Her school performance is extremely erratic. One day she does fine and the next day she can't seem to do anything. Then she usually becomes frustrated and ends up tearing up the work she did the day before. Her behavior is an enormous problem for everyone in the school. One minute she is sweet and loving, holding my hand, and the next minute she is screaming and throwing things. I have never seen such anger! She's a bomb ready to explode!

This behavioral description is a particularly striking example of the similarities between the behavior often ascribed to children who have been prenatally exposed to drugs and the behavioral characteristics of maltreated children.

Conclusion

There are many environmental risks that pose threats to healthy child development. These risks can act in combination with one another, as well as in combination with the perinatal risks described in the first chapter of this monograph, to produce a number of developmental deficits and other behavioral and cognitive problems that can threaten a child's development and educational success, as well as pose challenges to parents, other caregivers, and educators. Children with such attributes have begun appearing at increased rates in our nation's schools and preschools. At the same time, a number of programs designed specifically for drug-exposed children are making great strides in acknowledging the multiplicity of risk factors that come into play in the lives of these children. In addition, such programs seek to find strategies to improve the developmental and educational outcomes for at-risk children. These programs and the children they serve are the subject of the next chapter.

CHAPTER 3

Implications for Education in Preschool and Primary Grades

The previous chapters of this monograph explored the biological and environmental risks that affect the lives of many children in the United States. The risks begin with the poor health and nutritional status of the mothers. If a mother has poor nutrition, consumes illicit drugs or tobacco, and/or receives inadequate or no prenatal care, her baby is far more likely to be born prematurely, be small for gestational age, and have perinatal complications. While these conditions can pose significant danger to the infant, targeted interventions during early childhood can help avoid adverse outcomes.

Maternal use of alcohol, on the other hand, can lead to permanent and lifelong problems including mental retardation, physical abnormalities, and visual and auditory impairments (Autti-Ramo & Granstrom 1991; USDHHS 1990; Jessup & Green 1987; Streissguth, Clarren, & Jones 1985; Rosett & Weiner 1984; Iosub et al. 1981; Streissguth et al. 1978; Hanson, Jones, & Smith 1976).

While the physiological effects of prenatal exposure to alcohol appear to differ from those of prenatal exposure to illicit drugs, children growing up in families that abuse alcohol or other drugs are often exposed to a number of environmental risks. By the time children enter preschool, the caregiving environment has had ample opportunity to affect their development. For some, the environment poses many hazards, including inadequate caregiving; multiple, short-term foster-care placements; and abuse and neglect. As described in the previous chapter, the consequences of such environmental stress on child development can be devastating.

Both the consequences of maternal substance abuse and the effects of the environment on children's development and learning must be understood in order to marshall effective

resources for prevention and intervention. As Costella Tate, social worker for Project D.A.I.S.Y., in Washington D.C. comments, "Some of the identified children (prenatally exposed to drugs) had significant problems at birth due to a lack of oxygen, a by-product of drug abuse. However, by age three, most of these children are not exhibiting serious problems. This is especially true if the mom and baby had access to formal or informal support systems."

Given the many and varied influences on children who are prenatally exposed to drugs, it is no wonder that such children exhibit a range of characteristics. The patterns of maternal drug abuse, a family's stability, the caretaking skills of the parents, access to quality health care and education, and the availability of social support all vary enormously. So then do the developmental profiles of children.

Diverse Characteristics of Children

The fact that there is no typical profile of drug-exposed children is unanimously confirmed by leading practitioners. Their collective experiences underscore the individual needs and strengths of the children they serve.

In an effort to obtain firsthand accounts of specific behaviors exhibited by children prenatally exposed to drugs, our investigators included interviews with program administrators and practitioners from:

- PED (Children Prenatally Exposed to Drugs) Program in Los Angeles, California
- Operation PAR (Parental Awareness and Responsibility) in Largo, Florida
- Project D.A.I.S.Y. (Developing Appropriate Intervention Strategies for the Young Child) in Washington, D.C.
- Carousel Preschool Program in Tampa, Florida
- Parent-Child Intervention Program in East Palo Alto, California
- Hillsborough County Training Program in Tampa, Florida

They confirmed that the infants and young children in their programs display a range and variety of behaviors. Their clinical impressions are based on observations. While these reports are of children who have been (or are suspected of being) prenatally exposed to drugs, these experts stressed that the behavioral characteristics they observe are *not necessarily* the consequence of prenatal drug exposure. As Vicky Ferrara, a teacher in the PED Program, states, "once we have examined the histories of children, it is difficult to look at their behavior as specifically due to prenatal drug exposure."

Because practitioners do not see a specific constellation of behaviors and learning problems associated with drug-exposed children, they were

The predictability of the daily schedule and the consistency of staff in the program are critical strategies that limit changes and help children organize their environment.

asked to identify behavioral or developmental problems that most concern teachers working with an at-risk population. While their responses varied, three themes emerged.

Disorganization

Some children appear to have no framework by which to organize themselves or their environment. This disorganization is manifested in many ways. Some children move from object to object and place to place having great difficulty in completing age-appropriate tasks. While this affects their ability to manipulate materials and learn in solitary play, it can also affect their ability to participate in group activities. For example, a child participating with the teacher in a small group activity may be easily distracted by other materials or drawings on the wall. Once distracted by other items in the room, the child's attention is lost. This short attention span, coupled with a high level of activity, can create classroom disruptions that make it difficult for other children to play and learn. As a result, other children who are also disorganized are easily distracted and, once interrupted, have difficulty returning to the activity at hand.

Difficulty coping with change or transitions in the environment is viewed by some as another manifestation of the disorganization that some children experience. Children can be very fearful when encountering a new situation. Costella Tate from Project D.A.I.S.Y. illustrated this point by recounting a recent class field trip. Even with preparation, children became afraid of the subway and what might happen to them in this situation. What might have been an enjoyable excursion for many children became a frightening experience for these children at risk.

Changes in the staff of a preschool program present another type of transition. Some children will be very upset and cry if they come into the room and see that they have a substitute teacher for the day. The predictability of the daily schedule and the consistency of staff in the program are critical strategies that limit changes and help children organize their environment. Children who have difficulty coping with change need multiple cues to facilitate their moving from one activity to another.

Practitioners offer a variety of explanations for the levels of disorganization that they observe in some children. Some practitioners attribute the disorganization to a lack of early stimulation at home. Children who attend their programs have little or no exposure to the kinds of materials and equipment available in a typical preschool. Others emphasize the lack of adult-child interaction that helps children explore their environment systematically and develop a basic understanding of cause and effect. Some suspect that the disorganization they observe in some children is a consequence of neurological damage

resulting from prenatal exposure to alcohol or other drugs.

Language Delays

Practitioners also report a range of language and speech delays, including language-processing problems, poor articulation, limited vocabulary, and limited expressive language skills. Some children do not understand simple questions such as, "Are you hungry?" Even at five years old, they are unable to follow two-step commands. Another characteristic of children's language-processing problems is their inability to understand the real meaning of words and to generalize these "symbols of experience" to new but similar situations. Carol Cole offers a typical example, "If you tell a child not to go out into the street, he or she does not understand that you mean all streets."

Many practitioners identified poor articulation as a common problem, which makes children's communication attempts unintelligible to both teachers and peers. Superintendent Dr. Charlie Knight reported that children from the Parent-Child Intervention Program (PCIP) in East Palo Alto could not enunciate the word "potty" well enough to make themselves understood, and as a result had frequent toileting accidents.

Children's lack of vocabulary and limited abilities to express themselves are also related to some of the aggressive and disruptive behaviors reported. Children with limited language find themselves unable to engage in imaginative play. Taking on a role and acting it out are crucial to developing more advanced forms of play. Moreover, the frustration that children can feel when they are unable to make their needs known can lead to a variety of aggressive acts. Anyone who has taught in a preschool knows the importance of a child's being able to say "I was playing with that!" When the child cannot, grabbing is usually the next best strategy. Costella Tate from Project D.A.I.S.Y. provides the following vignette:

One little girl in the program was very distant with the teachers in the classroom. She was aggressive with other children and would strike out and hit them. As we worked with her, especially on her expressive language skills, her behavior started to improve. She was finally able to express her needs and feelings. It is hard to know exactly why she had no communication skills. Perhaps it was related to her exposure to drugs prenatally. Maybe it was the physical abuse she experienced as a baby.

Program staff repeatedly mentioned their concern about the caregiving environment as a factor contributing to children's language problems. "The lack of positive verbal interactions between parents and children along with the amount of TV that many children watch at home, all can affect a child's ability to communicate," said Linda Delapenha, diagnostic supervisor in the Hillsborough County Public Schools.

Children's lack of vocabulary and limited abilities to express themselves are also related to some of the aggressive and disruptive behaviors reported.

Insecure Attachments

Practitioners frequently refer to children's history of poor attachment to their caregivers. The PED Program reports that many children have five or six foster care or out-of-home placements by the age of three. Even if there are fewer placements, frequently they are unstable. In describing the foster-care system in California, Carol Cole explained that homes are often licensed for certain age groups only, so that as children mature, their foster placement changes. She states that "many children move for this reason. Others are waiting for decisions about reunification with their biological families. This lack of stability and security does not promote attachment and may affect children cognitively as well as emotionally."

It is not surprising, then, that some children have difficulty forming relationships with adults. Practitioners report that these children are indiscriminate in their attachments and will be too friendly or overly affectionate. Others rarely seek the assistance, comfort, and support of an adult.

It is well documented by researchers that early bonding and attachment can influence the development of future relationships. Many theorize that early bonding experiences provide children with a template that they continue to apply to their interactions, not only with adults but also with their peers. Depending on their early experiences, children may cling to adults, and be reluctant to venture out on their own and explore. When children's confidence and trust are compromised, they have difficulty making decisions and moving toward independence—a critical task in the preschool years.

Disorganization, speech and language problems, and the effects of poor attachment are some of the behaviors that most trouble professionals working with children who have been prenatally exposed to drugs and are exposed to other environmental risks.

These problems can impede learning, social development, and mastery over oneself and the environment.

Practitioners are just now beginning to follow into kindergarten and into the primary grades the cohort of children who were prenatally exposed to drugs and other risks. However, it is clear that if such problems persist, children will be at high risk for school failure.

As Courtney Cazden states, "language is both the curriculum content and the learning environment, both the object of knowledge and the medium through which knowledge is acquired." From first through third grade children are learning to write and to read, to encode symbols and decode symbols. They are asked to work increasingly on their own, remember and follow instructions, and relate concepts to one another. At this age children become intensely

interested in their peers and through their positive social interaction develop social competence.

Early intervention provided through such specialized programs as those described below and comprehensive child development programs such as Head Start will assist many children at risk to develop the skills needed to succeed in school.

The Promise of Specialized Programs

While researchers have been studying prenatal drug exposure, administrators and teachers have begun to develop programs to effectively address the troubling behaviors exhibited by children from environments in which substances are abused. Six nationally recognized programs are described below. They illustrate the range of characteristics exhibited by children at risk and detail the key features that make these programs successful.

PED Program

As early as 1984, the Los Angeles Unified School District recognized the need to establish a program to serve preschool children who were prenatally exposed to drugs. Initially, the PED (Children Prenatally Exposed to Drugs) Program was located in the Salvin School, one of 17 schools serving children in the district with special needs.

To be eligible for the PED Program, children must be three years of age and have an IQ within the normal range. In addition, children enrolled must have had a medical history of prenatal drug exposure and display one or more of the following behavioral characteristics: tremors, perceptual disorganization, blanking out, speech and language disorders, minimal developmental delays, disorganized play, difficulty with transitions, poor peer relationships, and poor coping skills (Los Angeles Unified School District 1989).

Early in its history, the sponsors of the PED Program recognized that children prenatally exposed to drugs do not need to be placed in a separate classroom. Maintaining children in separate classrooms allowed PED practitioners to learn more about such children's specific needs and to design appropriate interventions. Over the years, PED Program staff have systematically documented the behavioral characteristics of children enrolled and specific strategies that they found effective. Published as a practical guide, *Today's Challenge: Teaching Strategies for Working with Young Children Prenatally Exposed to Drugs/Alcohol* is now used by many other programs across the country (Los Angeles Unified School District 1989).

The PED Program articulates a clear philosophy based on children's needs for consistent and nurturing relationships. Therefore, an accepting and respectful emotional climate is at the heart of the PED Program's

approach to intervention. The context suggested by PED practitioners is one where "children know what's expected of them and know what to expect," explains Carol Cole, a former PED program teacher. The quality of teachers' interactions with children, predictable routines and rituals, careful observations and assessments, transition planning, and a high teacher-to-child ratio are all "protective factors" that PED staff incorporate into their design of preschool classrooms.

PED's guidebook organizes teaching strategies into six major areas: learning, play, social/emotional, communication, motor development, and home/school partnership. Suggested strategies embody developmentally appropriate practice and reflect the understanding that young children must be actively engaged in the learning process.

PED's pioneering work has significantly influenced the field through its clearly articulated approach to working with children prenatally exposed to drugs and environmental risks. The Los Angeles Unified School District, Division of Special Education has recently launched the Infant/Preschool Program, a model demonstration project to test strategies outlined by the PED Team in the district's publicly funded child-care centers. This important project, begun in 1991, will provide critical information on how successful and adaptable the PED Program model is when applied to integrated settings.

Operation PAR

As a therapeutic community in Florida, Operation PAR (Parental Awareness and Responsibility) has provided a comprehensive range of services since 1970. Because of its focus on recovering adults, PAR represents a different approach from PED and other school-based programs. In April 1990, a collaborative research and demonstration project between Operation PAR and the University of Southern Florida Psychiatry Department expanded PAR's treatment program for women. PAR Village is a residential therapeutic community where mothers, living with their children, participate in drug treatment. PAR Village is designed to address the common problem that chemically dependent mothers face—the lack of adequate child care that often forces mother to forgo or interrupt their treatment.

Mothers who enter this residential family program must be 18 or older and have a serious drug abuse or dependency problem. They must have a child under 12 months of age; they may also bring a second child age 10 or younger.

A key feature of PAR Village is a child-care program for drug-exposed infants and children of chemically dependent parents. Children enrolled in the center receive comprehensive evaluations that form the basis of individual education plans. The educational approach is based on the High

Scope Curriculum and the curriculum addresses the social, emotional, motor, language, and cognitive development of the children enrolled. In addition to typical child care activities, mothers routinely visit their children at child care to enhance the bonding between parent and child.

PAR Village offers a unique combination of services that addresses the multiple needs of chemically dependent mothers and their children. The program evaluation currently underway will yield important data on whether child care services linked to treatment produce better treatment outcomes for parents in the long term.

Project D.A.I.S.Y

Project D.A.I.S.Y. (Developing Appropriate Intervention Strategies for the Young Child) is one of the initiatives of the Early Childhood Program Branch in the District of Columbia Public Schools. This program is a developmentally appropriate, regular education program that includes in its population children who have been prenatally exposed to drugs.

Project D.A.I.S.Y. currently serves 60 children. Each classroom is comprised of fifteen children in each of the four classroom sites. Of the fifteen children in each classroom, five children are documented from the D.C. General Hospital Birth to Three tracking system as prenatally substance exposed. The other ten children in the classroom are students for whom no risk factors have been identified. The classrooms are multi-aged settings that fully integrate drug-exposed children with their non-exposed peers in regular education early childhood classrooms.

Project D.A.I.S.Y. is supported by a multidisciplinary consultation team comprised of two clinical social workers, three speech and language pathologists, two clinical psychologists, and a nutritionist. Additionally, the program offers parent groups and home-based intervention support to all of the children in the D.A.I.S.Y. classrooms and their families.

The emphasis of Project D.A.I.S.Y. is in the development of strategies that can be generalized to diverse populations of children that exhibit similar concerns. Some key concepts of this project include:

- Caring communities in which children share a common sense of belonging must be developed.
- Consistent routines and rituals that provide predictability in the environment must be established.
- Environments must reflect the range of developmental needs of students.
- Teachers must use and model a common language to create a common set of experiences and understanding for children.
- The curriculum must reflect the diversity of children.

- Parents must be viewed as partners in the educational process.

The dissemination of the effective strategies used in Project D.A.I.S.Y. is currently taking place in 60 schools within the District of Columbia.

Teachers noticed that many children took far longer to acclimate to the rules and routines of school.

Carousel Preschool Program

The Carousel Preschool Program is based at the Florida Mental Health Institute at the University of South Florida. Children are referred from the pediatric department within the College of Medicine at the university and are also self-referred from the community.

Prior to enrollment, children attend a full-day screening. They are observed by staff who use specific protocols for data collection. Standardized intelligence tests are also administered. Children attend the program five days per week, six hours per day. The program is in session for 11 months of the year. Two teachers with special education backgrounds and a part-time supervisor who has a mental health background are assigned to each classroom. In addition, each child is assigned a case manager who works with the entire family, referring the family to support services and evaluating the entire family's progress.

Carousel is funded by the Office of Special Education Programs in the U.S. Department of Education to develop a model for working with prenatally exposed children age two and one-half to school age. The program has been operating for six years. Currently they are serving sixteen children—eight typically developing children who have no known history of prenatal drug exposure and eight who have had positive toxicity screens at birth.

Parent-Child Intervention Program

Six years ago the Ravenswood City School District in East Palo Alto, California, began to search actively for support to develop programs for children prenatally exposed to drugs. The impetus came from the superintendent, Dr. Charlie Knight, who began getting calls from teachers expressing concerns about the difficult and different behaviors they were observing in the incoming kindergarten classes. Teachers noticed that many children took far longer to acclimate to the rules and routines of school. Unlike past groups of kindergartners, many of these five and six year olds would have frequent toileting accidents. The most disturbing problems identified were episodes of explosive and unprovoked violence.

Recognizing that drugs played an increasingly destructive role in the community, the district applied for and received funding from the Office of Substance Abuse Prevention (OSAP, HHS) to launch a Parent-Child Intervention Program (PCIP). Working with hospitals, clinics, and child protective service agencies, since 1989 the PCIP has provided child care

for infants, toddlers, and preschoolers prenatally exposed to drugs. Now serving 49 children from 20 families, PCIP offers both parent/caregiver education and support services. Through early intervention, the Ravenswood City Schools District is attempting to prevent the troubling behaviors that its teachers have observed in recent kindergarten classes.

Key ingredients for successful programming based on PCIP's experience include the following (Knight 1991):

- Support early development by providing services at or near birth.
- Provide child care that enables mothers and other caregivers to get respite care as well as treatment and other support services.
- Locate all the relevant community resources.
- Offer long-term services that acknowledge the range of supports that parents need to move away from drugs, acquire education, and settle in to employment.
- Require mothers to attend parenting counseling several times per week.
- Coordinate with critical county agencies such as child protective services, health clinics, treatment programs, and housing.
- Provide thorough and ongoing training for staff to equip them to respond to the diverse strengths and needs of the children and families they serve.

Hillsborough County Training Program

Hillsborough County Public Schools in Tampa, Florida, is the twelfth-largest district in the U.S., serving urban, rural, and suburban communities. Three years ago, the district organized a countywide task force called the Drug Exposed Children's Committee (DECC) to plan and coordinate services for drug-exposed children.

Comprised of school administrators, specialists, teachers, Head Start staff, and other community leaders, this committee began its work by conducting a study to identify four to six year olds prenatally exposed to drugs. Using a teacher-developed checklist of behaviors commonly attributed to drug-exposed preschoolers, researchers rated the behaviors of 85 children enrolled in programs serving a high-risk population. In addition, experienced clinical staff conducted interviews with children's parents to determine whether or not these children had been prenatally exposed to alcohol or other drugs. While the findings remain unpublished, DECC Chairperson Linda Delapenha reports that "there was no correlation between at-risk behaviors and parents' self-reports of substance abuse. Children with developmental and behavioral problems had complex histories including child abuse, parental

The list of communities adapting these approaches continues to grow.

death, prescription drug use by pregnant mothers, and other environmental or health problems sufficient to cause them to be at risk for school failure" (Delapenha n.d., unpublished).

Study results have formed the basis of the current philosophy of DECC and related school services. Linda Delapenha notes:

> One child in the study sample seemed to exhibit all the "classic signs" of a child who has been prenatally exposed to drugs: distractible, disorganized play, and somewhat violent and aggressive behavior. I was convinced that, of all the children studied, this child had definitely been exposed to drugs. The caregiver interview revealed something different. The child was being sexually abused. This was a good lesson for all of us (Delapenha 1991, personal communication).

Recent efforts of the DECC and the school district have primarily focused on providing an inservice training program for the district's preschool and primary school teachers to enhance their skills in working with at-risk children. Designed for teachers in mainstream settings, the training program is based on an early childhood education model rather than an instructional approach. It assumes that classrooms are equipped with interest centers, and children are actively engaged with a range of materials.

The training program is organized into six three-hour evening sessions and is designed to be highly interactive and practical. Early on, teachers are involved in make-and-take activities, which give them concrete ideas to integrate into their programs. Teacher recertification credits are offered to all those attending the training programs, providing an additional incentive for teachers to attend. Participating teachers come from a variety of school- and community-based settings, including state-funded preschool, preschool special education, Head Start, day care, and primary grades. The success of the training program has been recognized by the Robert Wood Johnson Foundation, which has awarded the Hillsborough County Public Schools with a two-year grant to develop its training program and disseminate it nationally.

These six programs are examples of ways in which the education and treatment communities are designing services to meet the needs of families and children living in situations in which alcohol and other drugs are abused. The list of communities adapting these approaches continues to grow. In some cases, this takes the form of direct services to preschoolers; in others, the services are focused on enhancing the skills of classroom staff in mainstream settings, such as preschools and primary grade classrooms.

Conclusion

Even though practitioners often find it difficult to define clearly the etiology of the problem behaviors they confront in the classroom, they have identified a number of strategies to

improve both the classroom environment and educational outcomes. Some of these strategies are grounded in sound early childhood education practices, while others are adapted from strategies used in special education. Practitioners have found that children need:

- environments that are flexible and allow visual stimuli to be regulated according to their abilities to manage these stimuli
- consistent and nurturing staff who form close bonds with the children in their care
- predictable routines so that they are able to anticipate and manage change
- transition procedures that allow them to ease slowly from one activity to another

Other aspects of sound programming include:

- the use of a wide range of assessment techniques that generate information regarding children's skill levels, coping strategies, and learning styles
- sound individual education plans
- learning environments that enable teachers to meet children's individual needs effectively
- strong partnerships between families and schools
- parent services, including parenting education, drug treatment programs, and social services

Summary and Implications

Many risk factors can compromise infant prospects for healthy development. The use of illicit drugs or alcohol by their mothers during pregnancy is among those risks. However, there are many other pre- and postnatal factors that can affect infant development. Some, such as prenatal care, can help moderate the risk of adverse outcomes associated with drug or alcohol exposure. Others, such as inadequate childrearing skills, can transform perinatal vulnerabilities into psychosocial disabilities with lifelong implications. What follows is a summary of conclusions drawn from the research about the role that prenatal exposure to drugs and other risk factors play in challenging the healthy development of our children as well as some of the ways in which this challenge can be met.

Effects of Prenatal Exposure to Alcohol and Other Drugs

- The use of alcohol during pregnancy can lead to Fetal Alcohol Syndrome (FAS) or Alcohol-Related Birth Defects (ARBD), both of which involve permanent physical and cognitive disabilities.
- Heroin, and possibly other illicit drugs, can result in the neonatal abstinence syndrome. While the long-term effects of this condition remain uncertain, it places substantial stress on both the infant and parents and requires extensive and expensive medical care.
- Prenatal exposure to alcohol and other drugs may contribute to a risk of other adverse perinatal outcomes and developmental delays. The extent of this contribution and the duration of these delays remain uncertain.
- Prenatal exposure to alcohol and other drugs can contribute to preterm and small-for-gestational-age (SGA) birth. Other factors that elevate the risk of preterm and SGA birth tend to concentrate in those sociodemographic groups that also have an elevated risk of prenatal drug and alcohol exposure.
- Preterm and SGA birth associated with, or independent of, prenatal drug or alcohol

exposure can have developmental consequences. Socioeconomic factors, and especially the extent of prenatal care, predict the extent of these consequences far better than biologic birth status.

Effects of Environmental Risks

- A number of postnatal risk factors can, individually or in combination with other factors including drug or alcohol exposure and/or preterm or SGA birth, contribute to behavioral and cognitive impairments.
- A substantial number of children who have been prenatally exposed to drugs grow up in environments characterized by postnatal risk factors, including poverty, exposure to violence, inadequate caregiving, parents who abuse alcohol and other drugs, child abuse and neglect, and multiple foster care placements.
- The effects of exposure to and anxiety caused by witnessing violence in the home and community can also affect children's emotional life and development.
- Risk factors in households in which the primary caregivers abuse alcohol and other drugs include family discord and violence, inadequate or inappropriate interactions with children, lack of adult supervision, and disorganization and instability.
- Child abuse or neglect can play a critical role in how children develop and behave. Risk factors for child abuse or neglect include a vulnerable perinatal status due to drug or alcohol abuse; preterm or SGA birth; parents who abuse alcohol and other drugs; and a household subject to stresses such as poverty and a lack of social supports.
- Many infants and children who are prenatally exposed to drugs have parents who abuse alcohol and other drugs, have been abused or neglected, and/or are placed in foster homes. Many experience multiple placements before they reach school age. While foster care may be preferable to life in a household in which alcohol and other drugs are abused, the instability and disruptions caused by foster placement, and especially multiple placements, also take a toll on a child's emotional and cognitive development.
- Postnatal risk factors can, individually or in combination, produce effects including behavioral disorganization, language delays, difficulties with attachment and bonding, memory and learning disorders, inadequate social skills that result in difficulty relating to peers and adults, post-traumatic stress disorder, and behavioral problems ranging from withdrawal to unprovoked violence.

A substantial number of children who have been prenatally exposed to drugs grow up in environments characterized by postnatal risk factors.

Educational Implications

Children entering preschool and elementary classrooms bring with them a wide range of behaviors, dispositions, and learning styles. Some of these pose problems, both for the children's healthy development and educational outcomes, and for classroom management. Many strategies for managing classrooms with children with cognitive and developmental challenges have been developed and used successfully throughout the country. In addition, a number of specialized programs are developing and refining approaches dealing with children whose development and educational success are threatened by prenatal drug and alcohol exposure, as well as the other risk factors outlined in this monograph. Careful assessment techniques, tailored educational interventions, opportunities for individual attention, and small class size can contribute to the healthy development of children and mediate the effects of behavioral, emotional, and cognitive problems, whatever their etiology.

It is dangerous to oversimplify a response to the "problem of drug-exposed children." Stereotyping these children can mislead teachers and other caregivers as to children's abilities and potential. Prenatal drug or alcohol exposure may indicate that a child is at risk, but exposure cannot be taken as a definitive sign that the child will not develop normally. As Richard Barth (1991) wrote, "Children exposed to drugs in utero do not represent a class of children—they may be as varied as children who are not exposed." At the same time, many children who are not prenatally exposed to alcohol face incredible threats to their health and development because of child abuse and maltreatment, parents who abuse alcohol and other drugs, violence, and a host of social ills. Ignoring these children simply because they are not drug exposed seriously underestimates the damage done by these other hazards.

It is up to us whether at-risk children will become members of a "lost generation." The success that dedicated practitioners have in reaching such children proves that growth, healthy development, and educational achievement are real possibilities for all children. With the proper knowledge and resources, practitioners can meet this challenge. Parents, educators, and citizens cannot, and should not, refuse these children the help they deserve in surmounting the barriers to a healthy and fulfilling future.

REFERENCES

Abel, E. (1981). Prenatal effects of beverage alcohol on fetal growth. *Progress in Biochemical Pharmacology, 18,* 111-114.

Abel, E. (1984). Smoking and pregnancy. *Journal of Psychoactive Drugs, 16*(4), 329-338.

Abel, E. (1985). Effects of prenatal exposure to cannabinoids. In T. Pinkert (Ed.), *Current research on the consequences of maternal drug abuse* (pp. 20-35). (NIDA Research Monograph 59). Rockville, MD: Department of Health and Human Services.

Abel, E., & Dintcheff, B. (1984). Factors affecting the outcome of maternal alcohol exposure: I. Parity. *Neurobehavioral Toxicology and Teratology, 6,* 373-377.

Abel, E., & Sokol, R. (1986a). Fetal alcohol syndrome is now leading cause of mental retardation. *Lancet II,* 1222.

Abel, E., & Sokol, R. (1986b). Maternal and fetal characteristics affecting alcohol's teratogenicity. *Neurobehavioral Toxicology and Teratology, 8,* 329-334.

Abel, E., & Sokol, R. (1987). Incidence of fetal alcohol syndrome and economic impact of FAS-related anomalies. *Drug and Alcohol Dependence, 19,* 51-70.

Abma, J., & Mott, F. (1991, May/June). Substance use and prenatal care during pregnancy among young women. *Family Planning Perspectives, 23*(3), 117-122.

Achenbach, T. et al. (1991). Seven-year outcome of the Vermont Intervention Program for Low-Birthweight Infants. *Child Development, 61,* 1672-1681.

Acker, D. et al. (1983). Abruptio placentae associated with cocaine use. *American Journal of Obstetrics and Gynecology, 146,* 220-221.

Affectk, G. (1986, Spring). Perceived social support and maternal adaptation during the transition from hospital to home care of high-risk infants. *Infant Mental Health Journal, 7*(1), 6-18.

Als, H. et al. (1986). Individualized behavioral and environmental care for the very low preterm infant at high risk for bronchopulmonary dysplasia: Neonatal intensive care unit and developmental outcome. *Pediatrics, 78,* 1123-1132.

Amaro, H. et al. (1990, May). Violence during pregnancy and substance use. *American Journal of Public Health, 80*(5), 575-579.

American Psychological Association (1993). *Violence and Youth: Psychology's Response, 1*: Summary Report of the American Psychological Association Commission on Violence and Youth.

Andreas, P., & Sharpe, K. (1991, May 5). Drug dealers fight a deadly war for a shrinking market. *Boston Globe,* p. 85.

Aronsson, M., Olegard, R., & Sabel, K. (1984). Dynamics of infant growth and development from birth to 18 months of age in relation to maternal alcohol consumption during pregnancy. Department of Applied Psychology, University of Goteborg, 9(3).

Autti-Ramo, I., & Granstrom, M. (1991). The psychomotor development during the first year of life of infants exposed to intrauterine alcohol of various duration: Fetal alcohol exposure and development. *Neuropediatrics, 22,* 59-64.

Aylward, G. et al. (1989, October). Outcome studies of low birth weight infants published in the last decade: A metaanalysis. *Journal of Pediatrics, 115,* 515-520.

Baldwin, J., & Oliver, J. (1975). Epidemiology and family characteristics of severely abused children. *British Journal of Preventive Social Medicine, 29,* 205-221.

Bancalari, E. (1991). Substance abuse in pregnancy: Effects on cardiorespiratory functions in the infant. In M. Kibey & K. Asghar (Eds.), *Methodological issues in controlled studies of effects of prenatal exposure to drug abuse.* (NIDA Research Monograph No. 114). Rockville, MD: National Institute on Drug Abuse.

Bandura, A. (1973). *Aggression: A social learning analysis.* Englewood Cliffs, NJ: Prentice-Hall.

Barr, H. et al. (1990). Prenatal exposure to alcohol, caffeine, tobacco, and aspirin: Effects on fine and gross motor performance in 4-year-old children. *Developmental Psychology, 20*(3), 339-348.

Barth, R. (1991a). Educational implications of prenatally drug-exposed children. *Social Work in Education, 13,* 130-136.

Barth, R. (1992b). Adoption of drug-exposed children. *Children and Youth Services Review, 13*(5-6), 323-342.

Bauchner, H. et al. (1988). Risk of sudden infant death syndrome among infants with *in utero* exposure to cocaine. *Journal of Pediatrics, 113,* 831-834.

Bauman, P. (1980). *A controlled study of drug-addicted mothers' parenting and their children's development.* Unpublished doctoral dissertation, California School of Professional Psychology, Berkeley.

Bauman, P., & Dougherty, F. (1983). Drug-addicted mothers' parenting and their children's development. *The International Journal of the Addictions, 18*(3), 291-302.

Bauman, P., & Levine, S. (1986). The development of children of drug addicts. *The International Journal of the Addictions, 21*(8), 849-863.

Becker, M., Warr-Leeper, G., & Leeper, H. (1990). Fetal alcohol syndrome: A description of oral motor, articulatory, short-term memory, grammatical, and semantic abilities. *Journal of Communication Disorders, 23*, 97-124.

Beckman, P. et al. (1986). A longitudinal study of stress and support in families of preterm and full-term infants. *Journal of the Division for Early Childhood, 11*(1), 2-9.

Beckwith, L. (1984). Parent interaction with their preterm infants and later mental development. *Early Child Development and Care, 16*, 27-40.

Belsky, J. (1980). Child maltreatment: An ecological integration. *American Psychologist, 35*(4), 320-335.

Berkowitz, L. (1970). The contagion of violence: An S-R mediational analysis of some effects of observed aggression. In W. Arnold & M. Page (Eds.), *Nebraska Symposium on Motivation*. Lincoln, NE: University of Nebraska Press.

Besharov, D. (1990). Crack children in foster care. *Children Today, 19*(4), 21-25, 35.

Billing, L. et al. (1980). Amphetamine addiction and pregnancy. III. One year follow-up of the children, psychosocial and pediatric aspects. *Acta Paediatrica Scandinavica , 69*, 675-680.

Bingol, N. et al. (1987). Influence of socioeconomic factors on the occurrence of fetal alcohol syndrome. *Advances in Alcohol and Substance Abuse, 6*(4), 105-118.

Black, M., & Schuler, M. (no date). *Prenatal exposure to cocaine: Neurobehavioral outcome and parent-infant interaction*. College Park, MD: University of Maryland School of Medicine.

Boone, M. (1989). *Capital crime: Black infant mortality in America*. Newbury Park, CA: Sage.

Brachfield, S., Goldberg, S., & Sloman, J. (1980). Parent-infant interaction in free play at 8 and 12 months: Effects of prematurity and immaturity. *Infant Behavior and Development, 3*, 289-305.

Brody, G., & Forehand, R. (1986). Maternal perceptions of child maladjustment as a function of the combined influences of child behavior and maternal depression. *Journal of Consulting and Clinical Psychology, 54*(2), 237-240.

Broekhuizen, F.F., Utrie, J., & Van Mullem, C. (1992, June). Drug use or inadequate prenatal care? Adverse pregnancy outcome in an urban setting. *American Journal of Obstetrics and Gynecology, 166*, 1747-1754.

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*, 513-531.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Brooks-Gunn, J., Liaw, F.R., Klebanov, P.K. (1992, March). Effects of early intervention on cognitive function of low birth weight preterm infants. *Journal of Pediatrics, 120*(3), 350-359.

Brunnquell, D., Crichton, L., & Egeland, B. (1981). Maternal personality and attitude in disturbances of child rearing. *American Journal of Orthopsychiatry, 51*, 680-691.

Bugental, D., Mantyla, S., & Lewis, J. (1989). Parental attributions as moderators of affective communication to children at risk for physical abuse. In D. Cicchetti & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect*. New York: Cambridge University Press.

Burd, L., & Martsolf, J. (1989). Fetal alcohol syndrome: Diagnosis and syndromal variability. *Physiology & Behavior, 46*, 39-43.

Burgess, R., & Conger, R. (1978). Family interaction in abusive, neglectful, and normal families. *Child Development, 49*, 1163-1173.

Burgess, A. et al. (1978). *Sexual assault of children and adolescents*. Lexington, MA: D.C. Heath Co.

Burkett, G., Yasin, S., & Palow, D. (1990, January). Perinatal implications of cocaine exposure. *Journal of Reproductive Medicine, 35*(1), 35-42.

Burnison, J. (1991). Testimony to U.S. House of Representatives Select Committee on Narcotics Abuse and Control. Chicago: National Association for Perinatal Addiction Research and Education.

Burns, W., & Clark, R. (1991). Dyadic disturbances in cocaine-abusing mothers and their infants. *Journal of Clinical Psychology, 47*(2), 316-319.

Camras, L. (1980). Children's understanding of facial expressions used during conflict encounters. *Child Development, 51*, 879-885.

Carter, R.L., Resnick, M.B., Ariet, M., Shieh, G., & Vonesh, E.F. (1992, January 30). A random coefficient growth curve analysis of mental development in low-birth-weight infants. *Statistical Medicine, 11*(2), 243-256.

Casiro, O.G., Moddelmann, D.M., Stanwick, R.S., & Cheang, M.S. (1991, July). The natural history and predictive value of early language delays in very low birth weight infants. *Early Human Development, 26*(1), 45-50.

Cassady, G., & Strange, M. (1987). The small-for-gestational-age (SGA) infant. In G. Avery (Ed.), *Neonatology: Pathophysiology and management of the newborn* (3rd ed.). Philadelphia: J. B. Lippincott.

Centers for Disease Control. (1982). *Congenital malformations surveillance report*, April 1977-March 1978.

Centers for Disease Control. (1985). Homicide among young black males-United States, 1970-1982. (1985). *Morbidity and Mortality Weekly Report, 34*.

Centerwall, B. (1984). Race, socioeconomic status, and domestic violence, Atlanta 1971-72. *American Journal of Public Health, 74*, 813-815.

Chasnoff, I. (1985). Effects of maternal narcotic vs. nonnarcotic addiction on neonatal neurobehavior and infant development. In T. Pinkert (Ed.), *Current research on the consequences of maternal drug abuse* (pp. 84-95). (NIDA Research Monograph 59). Rockville, MD: Department of Health and Human Services.

Chasnoff, I. (1991). Methodological issues studying cocaine use in pregnancy: A problem of definitions. In M. Kibey & K. Asghar (Eds.), *Methodological issues in controlled studies of effects of prenatal exposure to drug abuse* (pp. 55-56). (NIDA Research Monograph No. 114). Rockville, MD: National Institute on Drug Abuse.

Chasnoff, I., & Griffith, D. (1989). Cocaine: Clinical studies of pregnancy and the newborn. *Annals of the New York Academy of Sciences, 562*, 260-266.

Chasnoff, I., Burns, K., & Burns, W. (1987). Cocaine use in pregnancy: Perinatal morbidity and mortality. *Neurotoxicology and Teratology, 9*, 291-293.

Chasnoff, I. et al. (1983). Phencyclidine: Effects on the fetus and neonate. *Developmental Pharmacology and Therapeutics, 6*, 404-408.

Chasnoff, I. et al. (1985). Cocaine use in pregnancy. *New England Journal of Medicine, 313*, 666-669.

Chasnoff, I. et al. (1989a). Cocaine and pregnancy: Clinical and toxicological implications for the neonate. *Clinical Chemistry, 35*(7), 1276-1278.

Chasnoff, I. et al. (1989b, March 24/31). Temporal patterns of cocaine use in pregnancy. Perinatal outcome. *Journal of the American Medical Association, 261*(12), 1741-1744.

Chasnoff, I. et al. (1989c, May). Prenatal cocaine exposure is associated with respiratory pattern abnormalities. *American Journal of Diseases of Children, 143*, 583-587.

Chasnoff, I. et al. (1992, February 2). Cocaine/polydrug use in pregnancy: Two-year follow-up. *Pediatrics, 89*(2).

Cherukuri, R. et al. (1988, August). A cohort study of alkaloidal cocaine ("crack") in pregnancy. *Obstetrics and Gynecology, 72*(2), 147-151.

Chiu, T., Vaughn, A., & Carzoli, R. (1990, October). Hospital costs for cocaine-exposed infants. *Journal of the Florida Medical Association, 77*(10), 897-900.

Chouteau, M., Namerow, P., & Leppert, P. (1988). The effect of cocaine abuse on birth weight and gestational age. *Obstetrics and Gynecology, 72*, 351-354.

Church, M., & Gerkin, K. (1988). Hearing disorders in children with fetal alcohol syndrome. Findings from case reports. *Pediatrics, 82*(2). 147-154.

Cicchetti, D., & Rizley, R. (1981). Developmental perspectives on the etiology, intergenerational transmission, and sequelae of child maltreatment. *New Directions for Child Development, 11*, 31-55.

Cicchetti, D., Toth, S., & Hennessy, K. (1989, Summer). Research on the consequences of child maltreatment and its application to educational settings. *Topics in Early Childhood Special Education, 9*(2), 33-55.

Clarren, S., & Smith, D. (1978, May 11). The fetal alcohol syndrome. *The New England Journal of Medicine, 298*, 1063-1067.

Cohen, H.R., Green, J.R., Crombleholme, W.R. (1991, May). Peripartum cocaine use: estimating risk of adverse pregnancy outcome. *International Journal of Gynaecology and Obstetrics, 35*(1), 51-54.

Cohen, S., & Parmelee, A. (1983). Prediction of five-year Stanford-Binet scores in preterm infants. *Child Development, 54*, 1242-1253.

Cohen, S., Beckwith, L., & Parmelee, A. (1978, January). Receptive language development in preterm children as related to caregiver-child interaction. *Pediatrics, 61*(1), 16-20.

Cohen, S. et al. (1982). Perinatal risk and developmental outcome in preterm infants. *Seminars in Perinatology, 6*, 334-339.

Cohen, S. et al. (1986, April). Cognitive development in preterm infants: Birth to 8 years. *Developmental and Behavioral Pediatrics, 7*(2), 102-110.

Coles, C. et al. (1991). Effects of prenatal alcohol exposure at school age. I. Physical and cognitive development. *Neurotoxicology and Teratology, 13*(4), 357-367.

Coles, C., Platzman, K., Smith, I., James, M. et al. (1992, January-February). Effects of cocaine and alcohol use in pregnancy on neonatal growth and neurobehavioral status. *Neurotoxicology & Teratology, 14*(1), 23-33.

Cook, P., Petersen, R., & Moore, D. (1990). *Alcohol, tobacco, and other drugs may harm the unborn*. Rockville, MD: Office of Substance Abuse Prevention.

Crnic, K., Greenberg, M., & Slough, N. (1986, Spring). Early stress and social support influences on mothers' and high-risk infants' functioning in late infancy. *Infant Mental Health Journal, 7*(1), 19-33.

Day, N., Wagener, D., & Taylor, P. (1985). Measurement of substance use during pregnancy: Methodologic issues. In T. Pinkert (Ed.), *Current Research on the Consequences of Maternal Drug Abuse* (pp. 36-47). (NIDA Research Monograph 59). Rockville, MD: Dept of Health and Human Services

Deren, S. (1986). Children of substance abusers: A review of the literature. *Journal of Substance Abuse Treatment, 3*, 77-94.

Deren, S. (1990, April). Children of substance abusers in New York State. *New York State Journal of Medicine*, 179-184.

Dixon, S. (1989, April). Effects of transplacental exposure to cocaine and methamphetamine on the neonate. (Speciality Conference). *The Western Journal of Medicine, 150*(4), 436-442.

Dixon, S., & Bejar, R. (1989, November). Echoencephalographic findings in neonates associated with maternal cocaine and methamphetamine use: Incidence and clinical correlates. *The Journal of Pediatrics, 115*(5), 770-778.

Doberczak, T. et al. (1988). Neonatal neurologic and electroencephalographic effects of intrauterine cocaine exposure. *Journal of Pediatrics, 113*(2), 354-358.

Dodge, K. Social cognition and children's aggressive behavior. *Child Development, 51*, 162-170.

Dombrowski, M.P., Wolfe, H.M., Welch, R.A., & Evans, M.I. (1991, January). Cocaine abuse is associated with abruptio placentae and decreased birth weight, but not shorter labor. *Journal of Obstetrics and Gynecology, 77*(1), 139-141.

Dominquez, R., Vila-Coro, A.A., Slopis, J.M., & Bohan, T.P. (1991, June). Brain and ocular abnormalities in infants with in utero exposure to cocaine and other street drugs. *American Journal of Diseases of Children, 145*(6), 688-695.

Durand, D., Espinoza, A., & Nickerson, B. (1990, December). Association between prenatal cocaine exposure and sudden infant death syndrome. *Journal of Pediatrics, 117*(6), 909-911.

Education Development Center, Inc. (1991, June). *Needs assessment survey*. New England Resource Access Project, Newton, MA.

Edwards, M. (1979). Unclassified mental retardation. *Lancet, 1*, 928.

Erickson, M., Egeland, B., & Pianta, R. (1989). The effects of maltreatment on the development of young children. In D. Cicchetti & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect*. New York: Cambridge University Press.

Eriksson, M., Larsson, G., & Zetterstrom, R. (1981). Amphetamine addiction and pregnancy. II. Pregnancy, delivery, and the neonatal period. Socio-medical aspects. *Acta Obstet Gynecol Scand, 60*, 253-259.

Eriksson, M., Steneroth, G., & Zetterstrom, R. (1986). Influence of pregnancy and child-rearing on amphetamine-addicted women. *Acta Psychiatrica Scandinavica, 73*, 634-641.

Eriksson, M. et al. (1989). Health and development of 8-year-old children whose mothers abused amphetamine during pregnancy. *Acta Paediatrica Scandinavica, 78*, 944-949.

Ernhart, C. et al. (1989, June). Alcohol-related birth defects: Assessing the risk. *Annals of the New York Academy of Sciences, 562*, 159-172.

Fanshel, D., & Shinn, E. (1978). *Children in foster care: A longitudinal investigation*. New York: Columbia University Press.

Feldman, J.G., Minkoff, H.L., McCalla, S., & Salwen, M. (1992, May). A cohort study of the impact of perinatal drug use on prematurity in an inner-city population. *American Journal of Public Health, 82*(5), 726-728.

Field, T. (1983). Early interactions and interaction coaching of high-risk infants and parents. In M. Perlmutter (Ed.), *The Minnesota Symposium in Child Psychology* (Vol. 16, pp. 1-34). Hillsdale, NJ: L. Erlbaum.

Fiks, K., Johnson, H., & Rosen, T. (1985). Methadone-maintained mothers: 3-year follow-up of parental functioning. *The International Journal of the Addictions, 20*(5), 651-660.

Finnegan, L. (1988). Drug addiction and pregnancy: The newborn. In I. Chasnoff (Ed.), *Drugs, Alcohol, Pregnancy, and Parenting* (pp. 59-71). Hingham, MA: Kluwer Academic Publishers.

Fitzsimmons, J. et al. (1986). Pregnancy in a drug-abusing population. *American Journal of Drug and Alcohol Abuse, 12*(3), 247-255.

Fox, M., & Arcuri, K. (1980, September-October). Cognitive and academic functioning in foster children. *Child Welfare, 59*(8).

Frank, D. et al. (1988, December). Cocaine use during pregnancy: Prevalence and correlates. *Pediatrics, 82*(6), 888-895.

Fried, P. (1985). Postnatal consequences of maternal marijuana use. In T. Pinkert (Ed.), *Current research on the consequences of maternal drug abuse* (pp. 61-72). (NIDA Research Monograph 59). Rockville, MD: Department of Health and Human Services.

Fried, P., & Makin, J. (1987). Neonatal behavior correlates of prenatal exposure to marijuana, cigarettes, and alcohol in a low risk population. *Neurotoxicology and Teratology, 9*, 1.

Fried, P., & Watkinson, B. (1990, April). 36- and 48-month neurobehavioral follow-up of children prenatally exposed to marijuana, cigarettes, and alcohol. *Developmental and Behavioral Pediatrics, 11*(2), 49-58.

Fried, P., Innes, K., & Barnes, M. (1984). Soft drug use prior to and during pregnancy: A comparison of samples over a four-year period. *Drug and Alcohol Dependence, 13*, 161-176.

Fried, P., Watkinson, B., & Willan, A. (1984, September 1). Marijuana use during pregnancy and decreased length of gestation. *American Journal of Obstetrics and Gynecology, 150*, 23-27.

Fried, P. et al. (1980). Changing patterns of soft drug use prior to and during pregnancy: A prospective study. *Drug and Alcohol Dependence, 6*, 323-343.

Fried, P. et al. (1987). Neonatal neurological status in a low-risk population after prenatal exposure to cigarettes, marijuana, and alcohol. *Journal of Developmental and Behavioral Pediatrics, 8*, 318.

Frieze, I., & Browne, A. (1989). Violence in marriage. In L. Ohlin & M. Tonry (Eds.), *Family violence*. Chicago: University of Chicago Press.

Frodi, A. et al. (1978). Fathers' and mothers' responses to the faces and cries of normal and premature infants. *Developmental Psychology, 14*, 490-498.

Fulroth, R., Phillips, B., & Durand, D. (1989, August). Perinatal outcome of infants exposed to cocaine and/or heroin in utero. *American Journal of Diseases of Children, 143*, 905-910.

Galdston, R. (1965). Observations on children who have been physically abused and their parents. *American Journal of Psychiatry, 122*, 440-443.

Garbarino, J. (1990). The human ecology of early risk. In S. Meisels & J. Shonkoff (Eds.), *Handbook of early childhood intervention* (pp. 78-96). New York: Cambridge University Press.

Garbarino, J., & Crouter, A. (1978). Defining the community context for parent-child relations: The correlates of child maltreatment. *Child Development, 49*, 604-616.

Garbarino, J., Kostelny, K., & Dubrow, N. (1991). What children can tell us about living in danger. *American Psychologist, 46*(4), 376-383.

Gelles, R. (1973). Child abuse as psychopathology: A sociological critique and reformation. *American Journal of Orthopsychiatry, 43*, 611-621.

Gelles, R., & Cornell, C. (1985). *Intimate violence in families*. Newbury Park, CA: Sage.

Gelles, R., & Straus, M. (1988). *Intimate violence*. New York: Simon and Schuster.

General Accounting Office. (1990, June). *Drug-exposed infants: A generation at risk*. (GAO/HRD-90-138). Report to the Chairman, Committee on Finance, U.S. Senate.

Gibson, G., Bayhurst, P., & Collry, D. (1983). Maternal alcohol, tobacco, and cannabis consumption and the outcome of pregnancy. *Australian-New Zealand Journal of Obstetrics Gynecology, 23*(15)

Gil, D. (1970). *Violence against children: Physical abuse in the United States*. Cambridge, MA: Harvard University Press.

Gilchrist, L., Gillmore, M., & Lohr, M. (1990). Drug use among pregnant adolescents. *Journal of Consulting and Clinical Psychology, 58*(4), 402-407.

Gillogley, K. et al. (1990). The perinatal impact of cocaine, amphetamine, and opiate use detected by universal intrapartum screening. *American Journal of Obstetrics and Gynecology, 163*, 1535-1542.

Goerge, R. (1990, September). The reunification process in substitute care. *Social Services Review*. Chicago: University of Chicago.

Goldberg, S., Brachfeld, S., & Divitto, B. (1980). Feeding, fussing, and play: Parent-infant interaction in the first year as a function of prematurity and perinatal medical problems. In T. Field (Ed.), *High risk infants and children: Adult and peer interactions*. New York: Academic Press.

Golden, N. et al. (1984). Phencyclidine use during pregnancy. *American Journal of Obstetrics and Gynecology, 148*, 254-259.

Goldstein, M., & Tumo, A. (Eds.). (1987). Special section on high-risk research. *Schizophrenia Bulletin, 13*(3).

Goldstein, P. et al. (1987). Drug dependence and abuse. In R. Amler & H. Dull (Eds.), *Closing the gap: The burden of unnecessary illness*. New York: Oxford University Press.

Gomby, D., & Shiono, P. (1991, Spring). Estimating the number of substance-exposed infants. *The Future of Children, 1*(1), 17-25.

Goodman, E. (1992, January 12). The myth of the "crack babies." *Boston Globe.*

Graham, K., Feigenbaum, A., Pastuszak, A., Nulman, I., Weksberg, R., Einarson, T., Goldberg, S., Ashby, S., & Koren, G. (1992, August). Pregnancy outcome and infant development following gestational cocaine use by social cocaine users in Toronto, Canada. *Clinical Investigation in Medicine, 15*(4), 384-394.

Greenberg, M., & Crnic, K. (1988). Longitudinal predictors of developmental status and social interaction in premature and full-term infants at age two. *Child Development, 59*, 554-570.

Greene, T. et al. (1991). Prenatal alcohol exposure and cognitive development in the preschool years. *Neurotoxicology and Teratology, 13*, 57-68.

Greenland, S. et al. (1982). Effects of marijuana on human pregnancy, labor, and delivery. *Neurobehavorial Toxicology and Teratology, 4*, 447-450.

Gregg, J., Davidson, D., & Weindling, A. (1988, March 12). Inhaling heroine during pregnancy: Effects on the baby. *British Medical Journal, 296*, 754.

Griesbach, L., & Polloway, E. (1990). Fetal alcohol syndrome: Research and review implications. (ERIC Document Reproduction Service No. ED326 035). Lynchburg, VA: Lynchburg College.

Griffith, D. (1988). The effects of perinatal cocaine exposure on infant neurobehavior and early maternal-infant interactions. In I. Chasnoff (Ed.), *Drugs, alcohol, pregnancy, and parenting* (pp. 105-114). Hingham, MA: Kluwer Academic Publishers.

Griffith, D. *Congressional Testimony.* National Association for Perinatal Addiction Research and Education. May 6, 1991.

Gropper, B. (1985, February). Probing the links between drugs and crime. *National Institute of Justice Research in Brief.* Washington, DC: U.S. Department of Justice.

Hack, M. et al. (1991, July 25). Effect of very low birth weight and subnormal head size on cognitive abilities at school age. *New England Journal of Medicine, 325*(4), 231-237.

Haglund, B., & Cnattingius, S. (1990, January). Cigarette smoking as a risk factor for sudden infant death syndrome: A population-based study. *American Journal of Public Health, 80*(1), 29-32.

Handler, A. et al. (1991). Cocaine use during pregnancy: Perinatal outcomes. *American Journal of Epidemiology, 133*(8), 818-825.

Hanson, J., Jones, K., & Smith, D. (1976). Fetal alcohol syndrome, experience with 44 patients. *Journal of American Medical Association, 235*, 1458-1460.

Hanzlick, R., & Gowitt, G. (1991, February 13). Cocaine metabolite detection in homicide victims. *Journal of the American Medical Association, 265*(12), 1510.

Hartman, C., & Burgess, A. (1989). Sexual abuse of children: Causes and consequences. In D. Cicchetti & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect.* New York: Cambridge University Press.

Harwood, H. et al. (1984). *Economic costs to society of alcohol and drug abuse and mental illness 1980.* Research Triangle Park, NC: Research Triangle Institute.

Hatch, E., & Bracken, M. (1986). Effect of marijuana use in pregnancy on fetal growth. *American Journal of Epidemiology, 124*, 986.

Hawks, R., & Chiang, C. (Eds.). (1986). *Urine Testing for Drugs of Abuse.* (NIDA Research Monograph 73). Rockville, MD: U.S. Department of Health and Human Services.

Heier, L.A., Carpanzano, C.R., Mast, J., Brill, P.W., Winchester, P., & Deck, M.D. (1992, September-October). Maternal cocaine abuse: the spectrum of radiologic abnormalities in the neonatal CNS. *American Journal of Neuroradiology, 12*(5), 951-956.

Herman, J. (1981). *Father-daughter incest.* Cambridge, MA: Harvard University Press.

Herrenkohl, E., & Herrenkohl, R. (1979). A comparison of abused children and their nonabused siblings. *Journal of the American Academy of Child Psychiatry, 18*, 260-269.

Herrenkohl, R., & Herrenkohl, E. (1981). Some antecedents and developmental consequences of child maltreatment. *New Directions for Child Development, 11*, 57-76.

Herrenkohl, R., Herrenkohl, E., & Egolf, B. (1983). Circumstances surrounding the occurrence of child maltreatment. *Journal of Consulting and Clinical Psychology, 51*, 424-431.

Hill, H. (1991). *Children as witness to urban violence: Prevention for a vulnerable population.* Newton, MA: Education Development Center, Inc.

Hingson, R. et al. (1982). Effects of maternal drinking and marijuana use on fetal growth and development. *Pediatrics, 70*, 539.

Hoegerman, G., & Schnoll, S. (1991, March). Narcotic use in pregnancy. *Clinics in Perinatology, 18*(1), 51-76.

Hofer, M. (1981). *The roots of human behavior.* San Francisco, CA: W.H. Freeman.

Holmes, D., Nagy Reich, J., & Pasternack, T. (1984). *The development of infants born at risk.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Holzman, I. (1983). Fetal alcohol syndrome (FAS)—A review. *Children of Exceptional Parents,* 13-19.

Householder, J. et al. (1982). Infants born to narcotic-addicted mothers. *Psychological Bulletin, 92,* 453-468.

Howard, J. (1989, July). *Heavy substance abusers as parents: Results of an early intervention approach.* Paper presented at Protecting the Children of Heavy Drug Users, American Enterprise Institute for Public Policy Research.

Howard, J., & Kropenske, V. (1990). A prevention/intervention model for chemically dependent children and their offsprings. In S. E. Goldston et al. (Eds.), *Preventing mental health disturbances in childhood.* Washington, DC: American Psychiatric Press.

Howard, J., Kropenske, V., & Tyler, R. (1986). The long-term effects on neurodevelopment in infants exposed prenatally to PCP. In D. Clouet (Ed.), *Phencyclidine: An update* (NIDA Research Monograph 64). Rockville, MD: U.S. Department of Health and Human Services.

Howard, J. et al. (1989, June). The development of young children of substance-abusing parents: Insights from seven years of intervention and research. *Zero to three: Bulletin of the National Center for Clinical Infant Programs, 9*(5), 8-12.

Hoy, E.A., Sykes, D.H., Bill, J.M., Halliday, H.L., McClure, B.G., & Reid, M.M. (1992, April). The social competence of very-low-birthweight children: teacher, peer, and self-perceptions. *Journal of Abnormal Child Psychology, 20*(2), 123-150.

Huesmann, L. (1982). Television violence and aggressive behavior. In *Television and behavior: Ten years of scientific progress and implications for the eighties; Vol. 2: Technical reviews.* Rockville, MD: National Institute of Mental Health.

Hughes, D. et al. (1988). *The health of America's children.* Washington, DC: Children's Defense Fund.

Hume, R. et al., (1989). In utero cocaine exposure: Observations of fetal behavioral state may predict neonatal outcome. *American Journal of Obstetrics and Gynecology, 161,* 685-690.

Humphreys, J. (1984). Nursing care of abused children. In J. Campbell & J. Humphreys (Eds.), *Nursing care victims of family violence* (pp. 281-314). Reston, VA: Reston Publishing Company.

Hunt, J. (1981). Predicting intellectual disorders in childhood for preterm infants with birthweight below 1501 grams. In S. Friedman & M. Sigman (Eds.), *Preterm birth and psychosocial development.* New York: Academic Press.

Hutchings, D. (1985). Prenatal opoid exposure and the problem of causal interference. In *Current research on the consequences of maternal drug abuse* (pp. 6-19) (NIDA Research Monograph Number 59). Rockville, MD: National Institute on Drug Abuse.

Ihlen, B. et al. (1990). Changes in the use of intoxicants after onset of pregnancy. *British Journal of Addiction, 85,* 1627-1631.

Infant Health and Development Program. (1990, June 13). Enhancing the outcomes of low-birth-weight, premature infants. *Journal of the American Medical Association, 263*(22), 3035-3042.

Iosub, S. et al. (1981). Long-term follow-up of three siblings with fetal alcohol syndrome. *Alcoholism: Clinical and Experimental Research, 5,* 523-527.

Jaffe, P. et al (1986). Similarities in behavioral and social maladjustment among child victims and witnesses to family violence. *American Journal of Orthopsychiatry, 56,* 142-146.

Jeremy, R., & Bernstein, V. (1984). Dyads at risk: Methadone-maintained women and their four-month-old infants. *Child Development, 55,* 1141-1154.

Jessup, M., & Green, J. (1987, April/June). Treatment of the pregnant alcohol-dependent woman. *Journal of Psychoactive Drugs, 19*(2), 193-203.

Johnson, B., & Morse, H. (1968). Injured children and their parents. *Children, 15,* 147-152.

Johnson, H., & Rosen, T. (1990). Mother-infant interaction in a multirisk population. *American Journal of Orthopsychiatry, 60*(2), 281-288.

Johnson, H. et al. (1990). Resilient children: Individual differences in developmental outcome of children born to drug abusers. *The Journal of Genetic Psychology, 151*(4), 523-539.

Johnson, J., Boney, T., & Brown, B. (1990-1991). Evidence of depressive symptoms in children of substance abusers. *The International Journal of the Addictions, 25*(4A), 465-479.

Johnson, J., Rosen, T., & Glassman, M. (1983). *Children of methadone-maintained mothers: Three-year follow-up.* Rockville, MD: National Institute on Drug Abuse. (ERIC Document Reproduction Service No. ED 323 726)

Johnson, S., McCarter, R., & Ferencz, C. (1987). Changes in alcohol, cigarette, and recreational drug use during pregnancy: Implications for intervention. *American Journal of Epidemiology, 126*(4), 695-702.

Jones, K., & Smith, D. (1973). Recognition of the fetal alcohol syndrome in early infancy. *Lancet, 2*, 999-1001.

Jones, K. et al. (1973). Pattern of malformation in offspring of chronic alcoholic mothers. *Lancet, 2*, 1267-1271.

Kaltenback, K., & Finnegan, L. (1984). Developmental outcome of children born to methadone maintained women: A review of longitudinal studies. *Neurobehavioral Toxicology and Teratology, 6*, 271-275.

Kaye, K. et al. (1989, May). Birth outcomes for infants of drug abusing mothers. *New York State Journal of Medicine, 89*, 256-261.

Keith, L., MacGregor, S., & Sciarra, J. (1988). Drug abuse in pregnancy. In I. Chasnoff (Ed.), *Drugs, alcohol, pregnancy, and parenting* (pp. 17-46). Hingham, MA: Kluwer Academic Publishers.

Kelley, S.J., Walsh, J.H., Thompson, K. (1991, March-April). Birth outcomes, health problems, and neglect with prenatal exposure to cocaine. *Pediatric Nurse, 17*(2), 130-136.

Kempe, C. (1971). Pediatric implications of the battered baby syndrome. *Archives of Disease in Childhood, 46*, 28-37.

Kempe, R. & Kempe, C. (1978). *Child Abuse.* Cambridge, MA: Harvard University Press.

Klein, M., Maxson, C., & Cunningham, L. (1988, May). *Gang involvement in cocaine 'rock' trafficking* (Final Report, Grant No. 85-IJ-LX-0057). Washington, DC: National Institute of Justice.

Kline, J., Stein, Z., & Hutzler, M. (1987). Cigarettes, alcohol, and marijuana: Varying associations with birthweight. *International Journal of Epidemiology, 16*, 44.

Knight, C. (1991, July). Educational policy implications for serving drug-exposed children. *Hearing before the U.S. House of Representatives Select Committee on Narcotics Abuse and Control.* Prepared by Ravenswood City School District superintendent and staff, East Palo Alto, CA.

Koren, G. et al. (1989, December). Bias against the null hypothesis: The reproductive hazards of cocaine. *The Lancet, 2*, 1440-1442.

Kosofsky, B. (1991). The effect of cocaine in developing the human brain. In M. Kibey & K. Ashgar (Eds.), *Methodological issues in controlled studies of effects of prenatal exposure to drug abuse* (NIDA Research Monograph No. 114). Rockville, MD: National Institute on Drug Abuse.

Kristal, L. (1982). Bruxism: An anxiety response to environmental stress. In C. Spielberger, I. Sarason, & F. Milgram (Eds.), *Stress and Anxiety, 5*, 45-57.

Kronstadt, D. (1991, Spring). Complex developmental issues of prenatal drug exposure. *The Future of Children, 1*(1), 36-49.

Lagerstrom, M., Bremme, K., Eneroth, P., Magnusson, D. (1991a). School performance and IQ-test scores at age 13 as related to birth weight and gestational age. *Scandinavian Journal of Psychology, 32*(4), 316-324.

Lagerstrom, M., Bremme, K., Eneroth, P., Faxeluis, G., Magnusson, D., & Smedler, A.C. (1991b). WISC-test scores at the age of 10 for children born to women with risk pregnancies. *Journal of Perinatal Medicine, 19*(4), 269-283.

Lagerstrom, M., Bremme, K., Eneroth, P., & Janson, C.G. (1991c, July 1). School marks and IQ-test scores for low birth weight children at the age of 13. *European Journal of Obstetrics, Gynecology, and Reproductive Biology, 40*(2), 129-136.

Lahey, B. et al. (1984). Parenting behavior and emotional status of physically abusive mothers. *Journal of Consulting and Clinical Psychology, 52*, 1062-1071.

Landers, S. (1990, January). Increase in violence scars urban children. *American Psychological Association Monitor, 24*.

Largo, R. et al. (1986). Language development of term and preterm children during the first five years of life. *Developmental Medicine and Child Neurology, 28*, 333-350.

Larsen, J., & Horowitz, R. (1991). *Judicial primer on drug and alcohol issues in family cases.* American Bar Association.

LeBlanc, P. et al. (1987). Effects of intrauterine exposure to alkaloidal cocaine ("crack"). *American Journal of Diseases of Children, 141*, 937-8.

Legislative Analyst. (no date). *The 1989-90 Budget: Perspectives and Issues.* Report to the Joint Legislative Budget Committee.

Leif, N. (1976, May 20-21). Some measures of parenting behavior for addicted and nonaddicted mothers. *NIDA Symposium on Comprehensive Health Care for Addicted Families and Their Children*, 38-47.

Leif, N. (1981). Parenting and child services for drug dependent women. In G.M. Bechner et al. (Eds.), *Treatment services for drug dependent women, Volume I.* Rockville, MD: Department of Health and Human Services.

Leif, N. (1985). The drug user as parent. *The International Journal of Addiction, 20*(1), 63-97.

Lester, B., & Dreher, M. (1989). Effects of marijuana use during pregnancy on newborn cry. *Child Development, 60,* 765-771.

Levine, P. (1990). Outcomes of a therapeutic child care model for abused and neglected children: Relationships of mother characteristics to custody and safety of the child. Seattle: Experimental Education Unit, University of Washington.

Liebert, R., Neale, J., & Davidson, E. (1973). *The early window: Effect of television on children and youth.* New York: Pergamon Press.

Lifschitz, M., & Wilson, G. (1991). Patterns of growth and development in narcotic-exposed children. In M. Kilbey & K. Asghar (Eds.), *Methodological issues in controlled studies on effects of prenatal exposure to drug abuse* (pp. 323-339). (NIDA Research Monograph 114). Rockville, MD: Department of Health and Human Services.

Light, R. (1973). Abused and neglected children in America: A study of alternative policies. *Harvard Educational Review, 43,* 556-598.

Linn, S. et al. (1983). The association of marijuana use with outcome of pregnancy. *American Journal of Public Health, 73*(10), 1161-1164.

Little, B., & Snell, L. (1991, March). Brain growth among fetuses exposed to cocaine in utero: Asymmetrical growth retardation. *Obstetrics and Gynecology, 77*(3), 361-364.

Little, B., Snell, L., & Gilstrap, L. (1988, October). Methamphetamine abuse during pregnancy: Outcome and fetal effects. *Obstetrics and Gynecology, 72*(4), 541-544.

Little, B. et al. (1990, May). Patterns of multiple substance abuse during pregnancy: Implications for mother and fetus. *Southern Medical Journal, 83*(5), 507-509.

Livesay, S. et al. (1988). Cocaine and pregnancy: Maternal and infant outcome. In L. Harris (Ed.), *Problems of Drug Dependence 1988,* (NDDA Research Monograph 90) Rockville, MD: U.S. Department of Health and Human Services, 328.

Lochry, E. et al. (1982). Effects of acute alcohol exposure during selected days of gestation in C3H mice. *Neurobehavioral Toxicology and Teratology, 4,* 15-19.

Loftin, C., & Hill, R. (1974). Regional subcultures and homicide: An examination of the Gastil-Hackney thesis. *American Sociological Review, 39,* 714-724.

Longino, M. (1991, Fall). New help for drug-exposed children. *The Connection: National CASA Association, 7*(3).

Lorber, R., Felton, D., & Reid, J. (1984). A social learning approach to the reduction of coercive processes in child abusive families: A molecular analysis. *Advances in Behavior Research and Therapy, 6,* 29-45.

Los Angeles Unified School District. (1989, July). *Today's challenge: Teaching strategies for working with young children prenatally exposed to drugs/alcohol.* Los Angeles: Division of Special Education Prenatally Exposed to Drugs (PED) Program.

Ludman, W. et al. (1987, January). Birth weight, respiratory distress syndrome, and cognitive development. *American Journal of Diseases of Children, 141,* 79-83.

Luke, B. (1977). Maternal alcoholism and the fetal alcohol syndrome. *American Journal of Nursing, 77,* 1924-1926.

Lurio, J., Younge, R., & Selwyn, P. (1991, October 3). Underdetection of substance abuse. *The New England Journal of Medicine, 325*(14), 1045-1046.

Lutiger, B., Graham, K., Einarson, T.R., & Koren, G. (1991, October). Relationship between gestational cocaine use and pregnancy outcome: a meta-analysis. *Teratology, 44*(4), 405-414.

Maas, U. et al. (1990). Infrequent neonatal opiate withdrawal following maternal methadone detoxification during pregnancy. *Journal of Perinatal Medicine, 18,* 111-118.

MacGregor, S. et al. (1987, September). Cocaine use during pregnancy: Adverse perinatal outcomes. *American Journal of Obstetrics and Gynecology, 157,* 686-690

MacGregor, S. et al. (1989, December). Cocaine abuse during pregnancy: Correlation between prenatal care and perinatal outcome. *Obstetrics and Gynecology, 74*(6), 882-885.

MacGregor, S. et al. (1990, December). Prevalence of marijuana use during pregnancy: A pilot study. *The Journal of Reproductive Medicine, 35*(12), 1147-1149.

Magnano, C.L., Gardner, J.M., & Karmel, B.Z. (1992, March). Differences in salivary cortisol levels in cocaine-exposed and noncocaine-exposed NICU infants. *Developmental Psychology, 25*(2), 93-103.

Mallick, S., & McCandless, B. (1966). A study of catharsis of aggression. *Journal of Personality and Social Psychology, 4,* 591-596.

Marques, P.R. & McKnight, A.J. (1991). Drug abuse risk among pregnant adolescents attending public health clinics. *American Journal of Drug and Alcohol Abuse, 17*(4), 399-413.

Mastrogiannis, D. et al. (1990, July). Perinatal outcome after recent cocaine usage. *Journal of Obstetrics and Gynecology, 76*(1), 8-11.

Matera, C. et al. (1990, September). Prevalence of use of cocaine and other substances in an obstetric population. *American Journal of Obstetrics and Gynecology, 163*(3), 797-801.

Mayes, L. et al. (1992, January 15). The problem of prenatal cocaine exposure: A rush to judgment. *Journal of the American Medical Association, 267*(3), 406-408.

McBride, D. et al. (1986). Drugs and homicide. *Bulletin of the New York Academy of Medicine, 62*(5), 497-508.

McCalla, S. et al. (1991, February). The biologic and social consequences of perinatal cocaine use in an inner-city population: Results of an anonymous cross-sectional study. *American Journal of Obstetrics and Gynecology, 164*(2), 625-630.

McCalla, S., Minkoff, H.L., Feldman, J., Glass, L., & Valencia, G. (1992, May). Predictors of cocaine use in pregnancy. *American Journal of Obstetrics and Gynecology, 79*(5), 641-644.

McCance-Katz, E. (1991). The consequences of maternal substance abuse for the child exposed in utero. *Psychosomatics, 32*(3), 268-274.

McCann, E.M. & Lewis, K. (1991, December). Control of breathing in babies of narcotic- and cocaine-abusing mothers. *Early Human Development, 27*(3), 175-186.

McCormick, M., Brooks-Gunn, J., Workman-Daniels, K., Turner, J., & Peckham, G. (1992, February 26). The health and development status of very low-birth-weight children at school age. *The Journal of the American Medical Association, 267*(16), 2204-2208.

McNagny, S. E. & Parker, R. (1992, February 26). High prevalence of recent cocaine use and the unreliability of patient self-report in an inner-city walk-in clinic. *Journal of the American Medical Association, 267*(8), 1106-1108.

Menyuk, P. et al. (1991, February). Patterns of early lexical and cognitive development in premature and full-term infants. *Journal of Speech and Hearing Research, 34*, 88-94.

Mercy, J. et al. (1986). Patterns of homicide victimization in the city of Los Angeles, 1970-1979. *Bulletin of the New York Academy of Medicine, 62*(5), 423.

Molotsky, I. (1988, October 30). Capital's homicide rate is at a record. *New York Times*, p. A20.

Mondanaro, J. (1981). Reproductive health concerns for the treatment of drug dependent women. In G. Beschner, B. Reed, & J. Mondanaro (Eds.), *Treatment services for drug dependent women: Vol. 1.* (Treatment Research Monograph Series). Rockville, MD: U.S. Department of Health and Human Services.

Morales, A., & Sheafor, B. (1989). Urban gang violence: A psychosocial crisis. *Social work: A profession of many faces* (pp. 413-449). Boston: Allyn and Bacon.

Morse, C., Sahler, I., & Friedman, S. (1970). A three-year follow-up study of abused and neglected children. *American Journal of Diseases of Children, 120*, 437-446.

Mundal, L.D., VanDerWeele, T., Berger, C., Fitsimmons, J. (1991). Maternal-infant separation at birth among substance using pregnant women: Implications for attachment. *Social Work in Health Care, 16*(1), 133-143.

National Center for Children in Poverty (1991). *Five million children: 1991 update.* New York.

National Center for Children in Poverty. (1990). *Five million children: A statistical profile of our poorest young citizens.* New York.

National Center for Health Statistics. (1988). *Health, United States, 1988.* Washington, D.C.: Public Health Service, United States Department of Health and Human Services.

National Commission to Prevent Infant Mortality. (1990). *Troubling trends: The health of America's next generation.* Washington, D.C.: National Commission to Prevent Infant Mortality.

National Committee for Prevention of Child Abuse. (1990). NCPCA releases new statistics on child abuse reports and deaths. *Family Violence Bulletin, 6*(19).

National Institute on Drug Abuse. (1989, June). *Drug Abuse and Pregnancy* (NIDA Capsules CAP33). Rockville, MD: Press Office of the NIDA.

National Institute on Drug Abuse. (1991). *National Household Survey on Drug Abuse.* Rockville, MD: Substance Abuse and Mental Health Service Administration.

Nelson, J. et al. (1990). Fetal alcohol syndrome: Review of the literature and case report. *The New York State Dental Journal*, 24-27.

Neugut, R. (1981). Epidemiological appraisal of the literature on the fetal alcohol syndrome in humans. *Early Human Development, 5*, 411-429.

Norris, M. (1991). Suffering the sins of the mothers. *The Washington Post*, (June 30) A1.

Oberklaid, F., Prior, M., & Sanson, A. (1986, June). Temperament of preterm versus full-term infants. *Developmental and Behavioral Pediatrics, 7*(3), 159-162.

O'Connell, C., & Fried, P. (1991). Prenatal exposure to cannabis: A preliminary report of postnatal consequences in school-age children. *Neurotoxicology and Teratology, 13*(6), 631-639.

Olofsson, M. et al. (1983). Investigation of 89 children born by drug-dependent mothers. II. Follow-up 1-10 years after birth. *Acta Paediatrica Scandinavica, 72*, 407-410.

Olweus, D. (1978). *Aggression in the schools: Bullies and whipping boys*. Washington, DC: Hemisphere.

Oro, A., & Dixon, S. (1987). Perinatal cocaine and methamphetamine exposure: Maternal and neonatal correlates. *Journal of Pediatrics, 111*, 571-578.

Orraschel, H., Weissman, M., & Kidd, K. (1980). Children and depression: The children of depressed parents; the childhood of depressed patients; depression in children. *Journal of Affective Disorders, 2*(1), 1-16.

Ostrea, E.M., Brady, M., Gause, S., Raymundo, A.L., & Stevens, M. (1992, January). Drug screening of newborns by meconium analysis: a large-scale, prospective, epidemiological study. *Pediatrics, 89*(1), 107-113.

Overholser, J. (1990). Fetal alcohol syndrome: A review of the disorder. *Journal of Contemporary Psychotheraphy, 20*(20), 163-176.

Overpeck, M., Hoffman, H., Prager, K. (1992, March). The lowest brith-weight infants and the US infant mortality rate: NCHS 1983 linked birth/infant death data. *American Journal of Public Health, 82*(3), 441-444.

Parke, R., & Collmer, C. (1975). Child abuse: An interdisciplinary analysis. In E. Hetherington (Ed.), *Review of child development research* (Vol. 5, pp. 509-590). Chicago: University of Chicago Press.

Parker, R., & Smith, M. (1979). Deterrence, poverty, and type of homicide. *American Journal of Sociology, 85*, 614-624.

Pasto, M. et al. (1988). Cerebral sonographic characteristics and maternal and neonatal risk factors in infants of opiate dependent mothers. In L. Harris (Ed.), *Problems of drug dependence 1988* (p. 317). (NIDA Research Monograph 90). Rockville, MD: U.S. Department of Health and Human Services.

Pearlman, P. et al. (1982). Mothers and children together: Parenting in a substance abuse program. In B. Reed et al. (Eds.), *Treatment services for drug dependent women, Volume II* (pp. 532-571). Rockville, MD: Department of Health and Human Services.

Petitti, D., & Coleman, C. (1990, January). Cocaine and the risk of low birth rate. *American Journal of Public Health, 80*(1), 25-28.

Phibbs, C., Bateman, D., & Schwartz, R. (September 18, 1991). The neonatal costs of maternal cocaine use. *Journal of the American Medical Association, 266*(11), 1521-1526.

Pianta, R., Egeland, B., & Erickson, M. (1989). The antecedents of maltreatment: Results of the mother-child interaction research project. In D. Cicchetti & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect*. New York: Cambridge University Press.

Pierog, S., Chandavasu, O., & Wexler, I. (1977). Withdrawal symptoms in infants with the fetal alcohol syndrome. *Pediatrics, 90*, 630-633.

Pirani, B. (1978). Smoking during pregnancy. *Obstetrical and Gynecological Survey, 33*(1), 1-13.

Pletsch, P. (1988). Substance use and health activities of pregnant adolescents. *Journal of Adolescent Health Care, 9*, 38-45.

Poole, V.L. (1992, April). Pregnancy wantedness, attitude toward pregnancy, and use of alcohol, tobacco, and street drugs during pregnancy. *Dissertation Abstracts International, 52*(10B), 5193.

Pynoos, R., & Eth, S. (1985). Children traumatized by witnessing acts of personal violence: Homicide, rape, and suicide behavior. In S. Eth & R. Pynoos (Eds.), *Post-traumatic stress disorder in children* (pp. 17-22). Washington, DC: American Psychiatric Press.

Ramer, C., & Lodge, A. (1975). Neonatal addiction: A two-year study. Part I. Clinical and developmental characteristics of infants of mothers on methadone maintenance. *Addictive Diseases: An International Journal, 2*(2), 227-234.

Rand, M. (1990, June). *Handgun crime victims*. Bureau of Justice Statistics Special Report. Washington, DC: U.S. Department of Justice, Office of Justice Programs.

Randall, T. (1991, June 5). 'Intensive' prenatal care may deliver healthy babies to pregnant drug abusers. *Journal of the American Medical Association, 265*(1), 2773-2774.

Randall, T. (1992a, February 26). Infants, children test positive for cocaine after exposure to second-hand crack smoke. *Journal of the American Medical Association, 267*(8), 1044-1045.

Regan, D., Ehrlich, S., & Finnegan, L. (1987). Infants of drug addicts: At risk for child abuse, neglect, and placement in foster care. *Neurotoxicology and Teratology, 9*, 315-319.

Richardson, G., & Day, N. (1991). Maternal and neonatal effects of moderate cocaine use during pregnancy. *Neurotoxicology and Teratology, 13*(4), 455-460.

Riese, M. (1988, February). Temperament in full-term and preterm infants: Stability over ages 6 to 24 months. *Developmental and Behavioral Pediatrics, 9*(1), 6-11.

Riley, J., Brodsky, N., & Porat, R. (1988). Risk for SIDS in infants with *in utero* cocaine exposure: A prospective study (abstract). *Pediatric Research, 23*, 454A.

Rocissano, L., & Yatchmink, Y. (1983). Language skills and interactive patterns in prematurely born toddlers. *Child Development, 54*, 1229-1241.

Rodning, C., Beckwith, L., & Howard, J. (1989). Characteristics of attachment organization and play organization in prenatally drug-exposed toddlers. *Development and Psychopathology, 1*, 277-289.

Rose, S. (1991, August). Acknowledging abuse backgrounds of intensive case management clients. *Community Mental Health Journal, 27*(4), 255-263.

Rosen, T., & Johnson, H. (1985). Long-term effects of prenatal methadone maintenance. In T. Pinkert (Ed.), *Current research on the consequences of maternal drug abuse* (pp. 73-83). (NIDA Research Monograph 59). Rockville, MD: U.S. Department of Health and Human Services.

Rosenak, D. et al. (1990). Cocaine: Maternal use during pregnancy and its effect on the mother, the fetus, and the infant. *Obstetrical and Gynecological Survey, 45*, 348-359.

Rosenbaum, A., & O'Leary, K. (1981). Children: The unintended victims of marital violence. *American Journal of Orthopsychiatry, 51*, 692-699.

Rosenberg, M. et al. (1987). Violence: Homicide, assault, and suicide. In R. Amler & H. Dull (Eds.), *Closing the gap: The burden of unnecessary illness*. New York: Oxford University Press.

Rosett, H., & Weiner, L. (1984). *Alcohol and the fetus: A clinical perspective*. New York: Oxford University Press.

Rosett, H. (1980). A clinical perspective of the fetal alcohol syndrome. *Alcoholism: Clinical and Experimental Research, 4*, 119-122.

Rosner, M., Keith, L., & Chasnoff, I. (1982). The Northwestern University drug dependence program: The impact of intensive prenatal care on labor and delivery outcomes. *American Journal of Obstetrics and Gynecology, 144*, 23-27.

Ross, G., Lipper, E.G., Auld, P.A. (1991, December). Educational status and school-related abilities of very low birth weight premature children. *Pediatrics, 88*(6), 1125-1134.

Rouse, B., Kozel, N., & Richards, L. (Eds.). (1985). *Self-report methods of estimating drug use: Meeting current challenges to validity*. (NIDA Research Monograph 57). Rockville, MD: U.S. Department of Health and Human Services.

Rudolph, A. (1985). Animal models for study of fetal drug exposure. In *Prenatal drug exposure: Kinetics and dynamics* (pp. 5-16). (NIDA Research Monograph Number 60). Rockville, MD: National Institute on Drug Abuse.

Ruff, H., Blank, S., & Barnett, H. (1990). Early intervention in the context of foster care. *Developmental and Behavioral Pediatrics, 11*.

Russell, D. (1983). The incidence and prevalence of intrafamilial and extrafamilial sexual abuse of female children. *The International Journal of Child Abuse and Neglect, 7*. 133-146.

Russell, M. (1991, May-June). Clinical implications of recent research on the fetal alcohol syndrome. *Bulletin of the New York Academy of Medicine, 67*(3), 207-222.

Saigal., S., Szatmari, P., Rosenbaum, P., Campbell, D., King, S. (1991, May). Cognitive abilities and school performance of extremely low birth weight children and matched term control children at age 8 years: a regional study. *Journal of Pediatrics, 118*(5), 751-760.

Sameroff, A. (1981). Longitudinal studies of preterm infants. In S. Friedman & M. Sigman (Eds.), *Preterm birth and psychological development*. New York: Academic Press.

Sameroff, A., & Chandler, M. (1975). Reproductive risk and the continuum of caretaking causality. In F. Horowitz et al. (Eds.), *Review of Child Development Research 4* (pp. 187-243). Chicago: University of Chicago Press.

Sameroff, A., & Feil, L. (1984). Parental concepts of development. In I. Sigel (Ed.), *Parental belief systems: The psychological consequences for children*. Hillsdale, NJ: Erlbaum.

Sameroff, A., & Fiese, B. (1990). Transactional regulation and early intervention. In S. Meisels & J. Shonkoff (Eds.), *Handbook of early childhood intervention* (pp. 119-149). New York: Cambridge University Press.

Sameroff, A., Barocas, R., & Seifer, R. (1984). The early development of children born to mentally ill women. In N.F. Watt et al. (Eds.), *Children at risk for schizophrenia: A longitudinal perspective* (pp. 482-514). New York: Cambridge University Press.

Sampson, P. et al. (1989). Neurobehavioral effects of prenatal alcohol: Part II. Partial least squares analysis. *Neurotoxicology and Teratology, 11*(5), 477-491.

Samuels, B. (1986, January). Infant mortality and low birth weight among minority groups in the United States: A review of the literature. In *Report of the Secretary's task force on Black and minority health: Volume VI: Infant mortality and low birthweight*. Washington, DC: United States Department of Health and Human Services.

Sarvela, P.D, & Ford, T.D. (1992, May). Indicators of substance use among pregnant adolescents in the Mississippi Delta. *Journal of School Health, 62*(5), 175-179.

Saylor, C., Lippa, B., Lee G. (1991, March). Drug-exposed infants at home: Strategies and supports. *Public Health Nurse, 8*(1), 33-38.

Schechter, S. (1982). *Women and male violence: The visions and struggles of the battered women's movement*. Boston: South End Press.

Schneider, J.W., Chasnoff, I.J. (1992, March-April). Motor assessment of cocaine/polydrug exposed infants at age 4 months. *Neurotoxicology and Teratology, 14*(2), 97-101.

Seidman, D.S., Laor, A., Gale, R., Stevenson, D.K., Mashiach, S., & Danon, Y.L. (1992, April). Birth weight and intellectual performance in late adolescence. *Obstetrics and Gynecology, 79*(4), 543-546.

Select Committee on Children, Youth, and Families. (1989, November *U.S. House of Representatives*) No place to call home: Discarded children in America. Washington, DC: U.S. House of Representatives.

Senate Office of Research (1990). *California's drug-exposed babies: Undiscovered, unreputed, underserved*. Sacramento: Senate Office of Research.

Serdula, M. et al. (1991, February 20). Trends in alcohol consumption by pregnant women. *Journal of the American Medical Association, 265*(7), 876-879.

Sher, K.J., Walitzer, K.S., Wood, P.K., Brent, E.E. (1991, November). Characteristics of children of alcoholics: Putative risk factors, substance use and abuse, and psychopathology. *Journal of Abnormal Psychology, 100*(4), 427-488.

Signorielli, N., Gross, L., & Morgan, M. (1982). Violence in television programs: Ten years later. In *Television and behavior: Ten years of scientific progress and implications for the eighties* (Technical Reviews, Vol. 2, p. 168). Rockville, MD: National Institute of Mental Health.

Silvestri, J.M., Long, J.M., Weese-Mayer, D.E., & Barkov, G.A. (1991). Effect of prenatal cocaine on respiration, heart rate, and sudden infant death syndrome. *Pediatric Pulmonology, 11*(4), 328-334.

Slaby, R., & Quarfoth, G. (1980). Effects of television on the developing child. In B. Camp (Ed.), *Advances in behavioral pediatrics, 1*. Greenwich, CT: JAI Press.

Smedler, A.C., Faxelius, G., Bremme K., & Lagerstrom, M. (1992 March). Psychological development in children born with very low birth weight after severe intrauterine growth retardation: A 10-year follow-up study. *Acta Paediatr*, 81(3), 197-203.

Sparks, S. (1984, February). Speech and language in fetal alcohol syndrome. *American Speech-Language-Hearing Association*, 27-31.

Spence, M. et al. (1991, September). The relationship between recent cocaine use and pregnancy outcome. *Obstetrics and Gynecology, 78*(3, Pt. 1), 326-329.

Spungen, L., & Farran, A. (1986, October). Effect of intensive care unit exposure on temperament in low birth weight preterm infants. *Developmental and Behavioral Pediatrics, 7*(5), 288-292.

Starr, R. et al. (1984). The contribution of handicapping conditions to child abuse. *Topics in Early Childhood Special Education, 4*, 55-69.

State Interagency Task Force on Perinatal Substance Abuse (1991, January). *Report to the legislature: Options for recovery*. Sacramento: Health and Welfare Agency.

Stein, T. (1987). Foster care for children. In A. Minahan (Ed.), *Encyclopedia of Social Work*, (18th ed.). Silver Spring, MD: National Association of Social Workers.

Steinmetz, S., & Straus, M. (Eds.). (1974). *Violence in the family*. New York: Dodd Mead.

Stimmel, et al. (1982). Fetal outcome in narcotic-dependent women: The importance of the type of maternal narcotic used. *American Journal of Drug and Alcohol Abuse, 9*(4), 383-395.

Straus, M. (1980). Stress and physical child abuse. *Child Abuse and Neglect, 4*, 75-88.

Straus, M., & Allred, L. (1986). Methodological issues in detecting specific long-term consequences of perinatal drug exposure. *Neurobehavioral Toxicology and Teratology, 8*, 369-373.

Straus, M., & Gelles, R. (1988). How violent are American families? Estimates from the national family violence survey and other studies. In G. Hotaling et al. (Eds.), *Family abuse and its consequences: New directions in research*. Newbury Park, CA: Sage.

Straus, M., Gelles, R., & Steinmetz, S. (1980). *Behind closed doors: Violence in the American family*. Garden City, NY: Anchor.

Strauss, A., Modanlou, H., & Bosu, S. (1981). Neonatal manifestations of maternal phencyclidine (PCP) abuse. *Pediatrics, 68*, 550-552.

Streissguth, A., & Giunta, C. (1988). Mental health and health needs of infants and preschool children with fetal alcohol syndrome. *International Journal of Family Psychiatry*, 29-47.

Streissguth, A., & Martin, J. (1983). Prenatal effects of alcohol abuse in humans and laboratory animals. In B. Kissin & H. Begleiter (Eds.), *The Pathogenesis of Alcoholism*. New York: Plenum Press.

Streissguth, A., Barr, H., & Sampson, P. (1990 September/ October). Moderate prenatal alcohol exposure: Effects on child IQ and learning problems at age 7 1/2 years. *Alcoholism: Clinical and Experimental Research, 14*(5), 662-669.

Streissguth, A., Clarren, S., & Jones, K. (1985). Natural history of the fetal alcohol syndrome: A 10-year follow-up of 11 patients. *Lancet, 2*, 85-91.

Streissguth, A., Herman, C., & Smith, D. (1978a). Intelligence, behavior, and dysmorphogenesis in the fetal alcohol syndrome: A report on 20 clinical cases. *Journal of Pediatrics, 92*, 363-367.

Streissguth, A., Herman, C., & Smith, D. (1978b). Stability of intelligence in the fetal alcohol syndrome. A preliminary report. *Alcoholism, 2*, 165-170.

Streissguth, A., Randels, S., & Smith, D. (1991, July). A test-retest study of intelligence in patients with fetal alcohol syndrome: Implications for care. *Journal of the American Academy of Adolescent Psychiatry, 30*(4), 584-587.

Streissguth, A. et al. (1989a). Neurobehavioral effects of prenatal alcohol: Part I. Research Strategy. *Neurotoxicology and Teratology,, 11*(5), 461-476.

Streissguth, A. et al. (1989b). Neurobehavioral effects of prenatal alcohol: Part III. PLS analyses of neuropsychologic tests. *Neurotoxicology and Teratology, 11*(5), 493-507.

Streissguth, A. et al. (1991a, May). Cocaine and the use of alcohol and other drugs during pregnancy. *American Journal of Obstetrics and Gynecology, 164* (5 Pt. 1), 1239-1243.

Streissguth, A. et al. (1991b). Fetal alcohol syndrome in adolescents and adults. *Journal of the American Medical Association, 265*, 1961-1967.

Stromland, K. (1987, January/February). Ocular involvement in the fetal alcohol syndrome. *Survey of Ophthalmology, 31*(4), 277-284.

Suffet, F., & Brotman, R. (1984). A comprehensive care program for pregnant addicts: Obstetrical, neonatal, and child development outcomes. *The International Journal of the Addictions, 19*(2), 199-219.

Sweidan, J. et al. (1990). Cranial ultrasound findings in 50 term infants born to cocaine abusing mothers. *Clinical Research Abstract, 38*(1 Pt. 199A).

Szeto, H. (1991). Discussion: Methodological issues in controlled studies in affect of prenatal drugs. In M. Kibey & K. Asghar (Eds.), *Methodological issues in controlled studies of effects of prenatal exposure to drug abuse* (pp. 37-44). (NIDA Research Monograph No. 114). Rockville, MD: National Institute on Drug Abuse.

Tabor, B., Smith-Wallace, T., & Yonekura, M. (1990). Perinatal outcome associated with PCP versus cocaine use. *American Journal of Drug and Alcohol Abuse, 16*(3/4), 337-348.

Tardiff, K., & Gross, E. (1986). Homicide in New York City. *Bulletin of the New York Academy of Medicine, 62*(5), 413-426.

Television and behavior: Ten years of scientific progress and implications for the eighties (Summary Report, Vol. 1). (1982). Rockville, MD: National Institute of Mental Health.

Tennes, K. et al. (1985). Marijuana: Prenatal and postnatal exposure in the human. In T. Pinkert (Ed.), *Current research on the consequences of maternal drug abuse* (pp. 48-60). (NIDA Research Monograph 59). Rockville, MD: U.S. Department of Health and Human Services.

Terr, L. (1985). Children traumatized in small groups. In S. Eth & R. Pynoos (Eds.), *Post-traumatic stress disorder in children* (pp. 45-70). Washington, DC: American Psychiatric Press.

Terr, L. (1970). A family study of child abuse. *American Journal of Psychiatry, 127*, 665-671.

Timnick, L. (1989, September 5). Children of violence. *Los Angeles Times Magazine*, pp. 6-15.

Toufexis, A. (1991, May 13). Innocent victims. *Time Magazine*, pp. 56-60.

Tufts-New England Medical Center. (1984). *Final report to the Department of Juvenile and Delinquency Prevention*. Boston, MA: Tufts-New England Medical Center, Sexual Abuse Treatment Project.

U.S. Department of Health and Human Services. Office of Human Development Services. (1988). *Study findings: Study of national incidence and prevalence of child abuse and neglect*. National Center on Child Abuse and Neglect.

U.S. Department of Health and Human Services. (1987). *Alcohol and health, sixth special report to the U.S. Congress.* Washington, DC: U.S. Government Printing Office.

U.S. Department of Health and Human Services. (1988). *Study findings: Study of national incidence and prevalence of child abuse and neglect.* Washington, D.C.: Author.

U.S. Department of Health and Human Services. (1990). Fetal alcohol syndrome and other effects of alcohol on pregnancy outcome. In *Seventh special report to the U.S. Congress on alcohol and health from the Secretary of Health and Human Services* (pp.139-161). Rockville, MD: U.S. Department of Health and Human Services.

U.S. Department of Justice. (1988, September). Juvenile gangs: Crime and drug trafficking. *Juvenile Justice Bulletin.* Washington, DC: U.S. Department of Justice, Office of Juvenile Justice and Delinquency Prevention.

U.S. Senate, Committee on the Judiciary, Subcommittee on Juvenile Justice. (1983, February). *Gang violence and control. Hearings February 1983.* Washington, DC: U.S. Government Printing Office.

Umbreit, J., & Ostrow, L. (1980). The fetal alcohol syndrome. *Mental Retardation*, 109-111.

University of California, Centers for Disease Control. (1985). *The epidemiology of homicide in the city of Los Angeles: 1970-1979.* Washington, DC: U.S. Department of Health and Human Services.

Van Baar, A. (1990). Development of infants of drug-dependent mothers. *Journal of Child Psychology and Psychiatry, 31*, 911-920.

Van Baar, A., Fleury, P., & Ultee, C. (1989). Behavior in first year after drug dependent pregnancy. *Archives of Disease in Childhood, 64*, 241-245.

Van Baar, A. et al. (1989). Neonatal behavior after drug dependent pregnancy. *Archives of Disease in Childhood, 64*, 235-240.

Vietze, P., O'Connor, S., & Altmeier, W. (1982, April). *Continuity in mother-infant interaction in families with maltreated infants.* Paper presented at the meeting of the Society for Research in Child Development, Detroit.

Vohr, R., Garcia, C.C., Flanagan, P., Oh W. (1992, August). Effects of intraventricular hemmorrhage and socioeconomic status on perceptual, cognitive, and neurologic status of low birth weight infants at 5 years of age. *Journal of Pediatrics*, 121(2), 280-285.

Vorhees, C., & Mollnow, E. (1987). Behavioral teratogenesis: Long-term influences on behavior from early exposure to environmental agents. In J. Osofsky (Ed.), *Handbook of Infant Development* (2nd ed.). New York: John Wiley and Sons.

Walker, C., Zangrillo, P., & Smith, J. (1991). *Parental drug abuse and African American children in foster care: Issues and study findings.* Washington, DC: U.S. Department of Health and Human Services, National Black Child Development Institute.

Ward, S. et al. (1990). Sudden infant death syndrome in infants of substance-abusing mothers. *Journal of Pediatrics, 117*, 876-881.

Warren, K. (no date). Alcohol and maternal and fetal health. *Report of the Public Health Service Task Force on Women's Health Issues* (Vol. 11, pp. 48-52). U.S. Department of Health and Human Services.

Warren, K., & Bast, R. (1988). Alcohol-related birth defects: An update. *Public Health Reports*, 638-642.

Watt, J. (1987, Spring). Temperament in small-for-dates and pre-term infants: A preliminary study. *Child Psychiatry and Human Development, 173*, 177-188.

Weiner, L., & Morse, B. (1988). FAS: Clinical perspectives and prevention. In I. Chasnoff (Ed.), *Drugs, alcohol, pregnancy, and parenting* (pp. 127-148). Hingham, MA: Kluwer Academic Publishers.

Weissman, M., & Paykel, E. (1974). *The depressed woman: A study of social relations.* Chicago: University of Chicago Press.

Werner, E. (1990). Protective factors and individual resilience. In S. Meisels & J. Shonkoff (Eds.), *Handbook of early childhood intervention* (pp. 97-116). New York: Cambridge University Press.

Werthmann, M. (1981). Medical constraints to optimal psychological development of the preterm infant. In S. Friedman & M. Sigman (Eds.), *Preterm birth and psychological development.* New York: Academic Press.

Wilkins-Haug, L., & Gabow, P. (1991, April). Toluene abuse during pregnancy: Obstetric complications and perinatal outcomes. *Obstetrics and Gynecology, 77*(4), 504-509.

Williams, K. (1984). Economic sources of homicide: Reestimating the effects of poverty and inequality. *American Sociological Review, 49*, 283-289.

Wilson, G. et al. (1979, January). The development of preschool children of heroin-addicted mothers: A controlled study. *Pediatrics, 63*(1), 135-141.

Wilson, R. (1985). Risk and resilience in early mental development. *Developmental Psychology, 21*(5), 795-805.

Wilson, W. (1987). *The truly disadvantaged: The inner city, the underclass, and public policy.* Chicago: University of Chicago Press.

Wright, L.S., Garrison, J., Wright, N.B., & Stimmel, D. (1991). Childhood unhappiness and family stressors recalled by adult children of substance abusers. *Alcoholism Treatment Quarterly, 8*(4), 67-80.

Yamaguchi, K., & Kandel, D. (1987, May). Drug use and other determinants of premarital pregnancy and its outcome: A dynamic analysis of competing life events. *Journal of Marriage and the Family, 49*, 257-270.

Youngblade, L., & Belsky, J. (1989). Child maltreatment, infant-parent attachment security, and dysfunctional peer relationships in toddlerhood. *Topics in Early Childhood Special Education, 9*(2), 33-55.

Youngblade, L., & Belsky, J. (in press). The social and emotional consequences of child maltreatment. In R. Ammerman & M. Hersen (Eds.), *Children at risk: An evaluation of factors contributing to child abuse and neglect*. New York: Plenum Press.

Zahn, M. (1980). Homicide in the twentieth century United States. In J. Inciardi & C. Faupel (Eds.), *History and crime*. Beverly Hills, CA: Sage.

Zambrana, R.E., Hernandez, M., Dunkel-Schetter, C., & Scrimshaw, S. (1991, January). Ethnic differences in the substance use patterns of low-income pregnant women. *Family and Community Health, 13*(4), 1-11.

Zigler, E., & Hall, N. (1989). Physical child abuse in America: Past, present, and future. In D. Cicchetti & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect*. New York: Cambridge University Press.

Zinmeister, K. (1990, June). Growing up scared. *The Atlantic Monthly*, p. 50.

Zuckerman, B. (1988). Marijuana and cigarette smoking during pregnancy: Neonatal effects. In I. Chasnoff (Ed.), *Drugs, alcohol, pregnancy, and parenting* (pp. 73-90). Hingham, MA: Kluwer Academic Publishers.

Zuckerman, B. (1991a, July). Heavy drug users as parents: Meeting the challenge. Paper presented at the Protecting the Children of Heavy Drug Users meeting of the American Enterprise Institute for Public Policy Research, Williamsburg, VA.

Zuckerman, B. (1991b, Spring). Drug-exposed infants: Understanding the medical risk. *The Future of Children, 1*(1), 26-35.

Zuckerman, B., & Hingson, R. (1986). Alcohol consumption during pregnancy: A critical review. *Developmental Medicine and Child Neurology, 28*, 649-661.

Zuckerman, B. et al. (1985). A pilot study assessing maternal marijuana use by urine assay during pregnancy. In B. Rouse et al. (Eds.), *Self-report methods of estimating drug use: Meeting current challenges to validity* (pp. 84-92). (NIDA Research Monograph 57). Rockville, MD: U.S. Department of Health and Human Services.

Zuckerman, B. et al. (1989, March 23). Effects of maternal marijuana and cocaine use on fetal growth. *The New England Journal of Medicine, 320*(12), 762-768.

Zuckerman, D., & Zuckerman, B. (1985). Television's impact on children. *Pediatrics, 75*, 233-240.

Zuckerman, B., Maynard E.C., & Cabral, H. (1991, June). A preliminary report of prenatal cocaine exposure and respiratory distress syndrome in premature infants. *American Journal of Disabled Children* XX, *145*(6), 696-698.

APPENDIX A

Sources of Information

This appendix explains the sources of information used in the three major sections of the monograph.

Effects of Prenatal Exposure to Alcohol and Other Drugs

Five databases were searched for citations to research reports since 1980 on the effects of prenatal exposure to alcohol and other drugs. These databases included MEDLINE, ERIC, ECER, PsycINFO, and Drug Information-Alcohol Use/Abuse. Selected articles were read to inform our work, focusing on:

- the primary research on the effects of prenatal drug exposure and its long-term developmental outcomes
- the most important historical and contemporary research on prenatal alcohol exposure, as well as several comprehensive reviews of the literature on this subject
- reports, descriptions, and materials emanating from programs whose goals include improving the developmental and educational outcomes of children prenatally exposed to drugs and alcohol

Published research was augmented with interviews with six researchers currently engaged in studies of prenatal drug or alcohol exposure. These studies were identified by reviewing:

- research reports cited in the literature searches described above
- grant and contract awards and other resource materials provided by the Office of the Assistant Secretary for Planning and Evaluation, the Department of Education, the National Institute on Drug Abuse, and the Administration on Children and Families
- testimony at congressional hearings provided by the project sponsors and identified through a search of the Government Printing Office Monthly Catalog Database and obtained from congressional committees and subcommittees
- the Federal Research in Progress database

The researchers generously shared their time and thoughts concerning prenatal exposure to alcohol and other drugs. None commented in detail on current unpublished research. The standards of medical research and the requirements of many peer-reviewed medical journals recognize the danger of premature release of research data or conclusions, which may be misinterpreted by the lay community, divorced from the methodological context and the author's full text. However, the researchers provided citations to or copies of recent and forthcoming publications, ensuring access to the most recent available information. Appendix B includes a list of those interviewed.

Research and information on the effects of preterm and small-for-gestational-age births were identified as well as prevalence and sociodemographic considerations, by:

- searching MEDLINE

- consulting resources on early child development
- reviewing the reference lists of relevant articles identified during the primary literature search
- reviewing HOLLIS, the catalog of the library collections of Harvard University

Environmental Risks and Implications for Development

Much of the base material for this section was gathered using:

- standard sources on the relevant issues
- targeted literature searches in MEDLINE, ERIC, ECER, Family Resources, Child Abuse and Neglect Database, and PsycINFO
- reference lists of the articles on prenatal drug and alcohol exposure, many of which cite research relevant to confounding and intervening variables

Also utilized were inhouse expertise and resources on child development; substance abuse; child abuse and neglect; domestic, peer, and community violence; and the effects of poverty on family systems.

Implications for Education in Preschool and Primary Grades

Comprehensive studies describing the behavioral, psychological, and demographic characteristics of the current population of at-risk children seen in preschools and programs for drug-exposed children do not exist. A few programs have published clientele descriptions, but these lack methodological rigor. Thus most of our information on these children was obtained from practitioners and practitioner reports. Practitioners with programs for drug-exposed children were identified by reviewing:

- program descriptions and reports identified through the literature review
- testimony before congressional hearings
- articles in the popular press provided by the project sponsors and identified through searches of the PAPERS, UPI, and AP databases
- program descriptions and materials provided by the project sponsors

Using semistructured protocols, representatives from 12 programs were interviewed. Appendix B identifies these individuals and their programs.

APPENDIX B

Experts Interviewed

Person/Organization	Practitioner		Researcher
	Protocol 1 *To obtain general program info*	Protocol 2 *To follow up on specific child characteristics*	Protocol 3 *To identify relevant research underway*
Corinne Baker, Early Childhood Specialist, Operation PAR, Largo, Florida		X	
Carol Cole, M.A., Project Leader, Infant/Preschool Program, LA Unified School District, Los Angeles, California	X	X	
Nancy Day, M.D., Dept. of Epidemiology, University of Pittsburgh, Pittsburgh, Pennsylvania			X
Linda Delaphenha, M.S., Supervisor, Primary Diagnostic Services, Hillsborough County Public Schools, Tampa, Florida	X	X	
Eugene Edgar, Ph.D., Childhaven, University of Washington, Seattle, Washington	X		
Fonda Eyler, M.D., University of Florida, Gainesville, Florida			X
Vicky Ferrara, Program Teacher, PED Program, LA Unified School District, Los Angeles, California		X	
Peter Fried, Ph.D., Carlton University, Province of Ontario, Ottawa, Canada			X
Mary Lou Nava Hamaker, Ph.D., LA County Office of Education, Head Start, Downey, California	X		
Charlie M. Knight, Ph.D., Superintendent, Ravenswood City School District, East Palo Alto, California	X	X	
Kathleen Kundrat, Director, Northwest Michigan Human Services Agency, Head Start, Traverse City, Michigan	X		
Nancy Lodl, Information Specialist, NAPARE, Chicago, Illinois			X
Mary McEvoy, Ph.D., University of Minnesota			X
Joanne Miller, Mental Health Specialist, LA County of Education, Head Start, Downey, California	X		
Pamela Osnes, M.A., Director, Carousel Preschool Program, Florida Mental Health Inst., University of So. Florida, Tampa, Florida	X	X	
Diane E. Powell, Ph.D., Project Director, Project D.A.I.S.Y., District of Columbia Public Schools, Washington, D.C.	X		
Margot Kaplan Sanoff, Ed.D., Steps for Kids Project, Boston City Hospital, Boston, Massachusetts	X		
Allan Shedlin, Executive Director, Elementary School Center, New York, New York	X		
Donna Sicilian, Coordinator of Children's Services, Operation PAR, Largo, Florida	X		
Ann Streissguth, M.D., University of Washington			X
Costella Tate, Social Worker, Project D.A.I.S.Y., District of Columbia Public Schools, Washington, D.C.	X	X	
Valerie Wallace, Psychologist, PED Program, LA Unified School District, Los Angeles, California		X	
Sharon Wien, Center for Family Resources, Inc., Wanaque, New Jersey	X		

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